

JOHNSON'S STANDARD FIRST AID MANUAL

Suggestions for Prompt Aid to the Injured
in Accidents and Emergencies

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In collaboration with Eminent Surgeons, First Aid Authorities and Specialists

ILLUSTRATED

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PREFACE TO THE EIGHTH REVISION

In preparing this new and thoroughly revised edition the dominant desire has been to make it continue worthy its place as a standard authority on first aid.

The editor has been fortunate in receiving the suggestions of able and eminent specialists, representative surgeons, first aid teachers and first aid workers of long experience in railway, mining, police and ambulance service in this country and abroad, some of whose names are elsewhere noted. The Manual now reflects the opinion of the whole field of first aid in a way that makes for uniformity in methods and materials and common rules of practice for all ordinary emergencies. It standardizes first aid.

All of the characteristic features of previous editions which have stood the severe test of practical experience and professional criticism and have won popular approval are retained. All new information brought to light by the rapid development of the practice of the art of first aid is added. The entire text has been rewritten, reedited and reset. New illustrations have been made from living models, under the direction of trained workers.

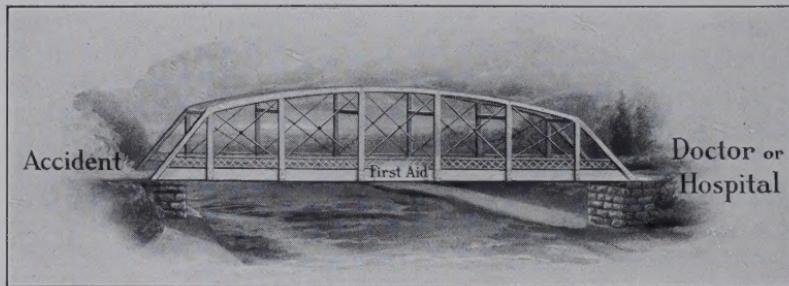
The suggestions given in the Manual are not intended to be elaborate. Extensiveness has been sacrificed to simplicity. Much that is usually found in works of this character has been omitted, and only that believed to be the most simple, essential and helpful has been selected. No attempt has been made to teach anatomy or physiology, or to give instruction in the principles and practice of surgery.

Technical terms have been avoided. Everything is placed before the reader in the simplest and plainest form.

Thus the work becomes more than ever a standard First Aid Manual for everyday use and from it any one who can read English or understand a picture may gain information which will serve in emergency.

WHAT IS FIRST AID?

First aid to the injured has been aptly described as a bridge between the accident and medical or surgical assistance, and over this bridge the injured person is to be carried from the place of injury to a place of treatment. Once the bridge is crossed, and the injured person is placed in the hands of the medical attendant (or hospital), first aid is at an end.



Such action is first aid whoever may render it. A person trained in first aid, a physician or a nurse, may render more skillful aid than one who is untrained, but in every instance the action is first aid.

First aid teachers, workers and trainers are apt to go beyond the scope and limit of true first aid as here outlined. For example, the treatment and care of injuries, the administration of medicines, the diagnosis and treatment of disease are no part of first aid work.

It is undoubtedly a mistake for first aid teachers to attempt to train workers in anatomy or physiology, except when limited to the most elementary phases; certainly it is far outside the principles of first aid to attempt the treatment of disease, the after-care of wounds, the setting of fractures, and the like. It is a well settled principle that it is dangerous for first aid workers to attempt any form of treatment other than the simplest temporary measures.

But first aid work goes beyond the handling of accidents. It now involves the prevention of the spread of contagion, relief in sudden sickness and other emergencies.

HOW TO USE THE MANUAL

This Manual is designed as a working Manual in first aid, and is arranged in such a manner that any particular subject can be quickly referred to at the time of emergency. The possessor of the Manual, however, should not wait for an accident to occur before testing the value of these instructions, or his own ability to carry them out.

Those who are likely to be called upon to take care of the injured should familiarize themselves with this book, as well as with the materials which are to be applied. To this end it is suggested that you read the book through and note its order and the general principles that govern first aid. This should be followed by a more careful study of the suggestions and details, and an attempt made to impress the more important points upon the memory.

Of particular importance is a working knowledge of what to do in great emergencies. Hence the sections of the Manual headed: The First Things to Do, Shock, Bleeding, Burns and Scalds, Fractures, Wounds, Drowning, Apoplexy, Fainting, Bites of Rabid Animals, and Poisons should receive careful study. The student should particularly study the methods which apply to his own calling in life.

Designedly no instructions are given in this Manual in respect to anatomy or physiology. All who cooperated in the revision agreed that a knowledge of these subjects is not essential either to the intelligent use of the Manual or to the application of first aid. The reader who may have occasion to practice first aid as a calling is, however, advised to secure, on the recommendation of a physician, some simple text-book upon these subjects. From such a source he can familiarize himself in a general way with the structure and functions of the human body, including the bones, muscles, arteries and veins, circulation, respiration and nervous system. The general direction of the main arteries, and the location of the points where the circulation may be arrested by pressure may be learned by a study of the illustrations in this Manual. The reader is urged to determine upon himself, or better still, upon an assistant, the location of main points where pressure is to be applied in cases of bleeding. He should also be able to locate the principal parts of the skeleton which are liable to become fractured.

Practice makes perfect. Therefore the reader will be greatly benefited if he will procure a supply of the dressings and some of the

appliances suggested, and actually use them. He can practice upon himself or secure the aid of friends to act as patients. Bandages or other articles used for practice purposes should never be applied to a wound; they should be used for practice only. Familiarity with the contents and use of such an article as the First Aid Packet is of prime importance.

In factories, mines, shops, and places of like character, the Manual and all first aid material should be placed in charge of the superintendent, foreman, or some suitable person who is likely to be constantly on duty. The Manual should be kept in a conspicuous place, in order that it may be the first thing found in emergency.

All material to be used for first aid purposes should be kept in a closed box, or closet, to rigidly exclude dust or dirt. Unnecessary handling of first aid material should be avoided. Dressings for first aid purposes should be procured only in sealed packages, and should not be opened except as needed for use. All dressings to be applied to wounds should be such as are known to be surgically clean and aseptic, and should be kept in the original sealed package.

The instructions and illustrations given in this book are such as will apply to dressings and material which may be procured at any drug store. Directions for the preparation of home-made appliances are included, as well as suggestions for the use of material that is likely to be found at any place where an accident may occur.

The layman into whose hands this Manual may fall should ever bear in mind the oft-repeated injunction: "Send for a physician." However great or small may be the emergency, nothing can take the place of a physician. "A little knowledge is a dangerous thing." "Beware of an axe in the hands of a child." All of the first aid manuals ever printed, if taken together, would not transform a layman into a surgeon. Hence it is of prime importance that the layman shall acquire the art of knowing just when to cease all attempts at first aid and place the patient in the hands of a surgeon.

PRINCIPLES OF FIRST AID

The first aid student should be observant, noting the cause and signs of injury. Tactful, that he may avoid thoughtless questions and learn the symptoms and history of the case.

Resourceful, using to the best advantage whatever is at hand to prevent further damage.

Explicit, giving clear instructions to the patient and advice to the assistants.

Discriminating, that he may decide which of the several injuries should be given attention.

THE FIRST THING TO DO

Keep cool. Send for a surgeon at once. Write a brief message describing the accident and injury, that the surgeon may know what instruments and remedies to bring.

Assume command of the situation. There can be only one chief.

Give first aid treatment as soon as possible. Keep bystanders away. Give the victim room to breathe. If possible and safe, remove the patient to a quiet, airy place, where the temperature is moderate; never to a hot room. Handle the patient firmly but gently.



FIG. 1.—Injured patient with head slightly lower than the body.

Place the injured person in a comfortable position, preferably on his back. Loosen the collar, waist-band and belt. Straighten the limbs out in their natural position, preferably with the toes up. Injuries to the head may require that the head be raised higher than the level of the body. If breathing is difficult a sitting position is best. If the patient be faint, let his head be lower than his feet. If a leg or arm be injured, raise it slightly and lay it upon a cushion or pillow.

Watch the patient carefully if he be unconscious.



FIG. 2.—Method of relieving vomiting.

If vomiting occurs, turn the patient's head on one side so as to keep the mouth clear of vomited food.

In factories and mills the phone number of the nearest physician should be posted near the phone.

If a wound be discovered in a part covered by the clothing, cut the clothing in the seam, so as to bandage the wound. In case of burns, cut away with a scissors that part of adhering clothing and do not attempt to remove same by pulling forcibly.

Dress all wounds as quickly as possible. (See instructions elsewhere in this Manual.) If severe bleeding should occur, stop it before the wound is dressed.

After dressing a wound, do only what is necessary to restore consciousness or to transport the patient to a place of safety.

SHOCK OR COLLAPSE

Shock is common after serious accidents.

Do not allow a person to see his own injury, especially bleeding. It may provoke shock.

The signs of shock are a cool, clammy skin, vomiting and retching, weak, rapid pulse, sighing or irregular breathing, half-opened eyelids, dilated pupils, dullness of mind, and sometimes insensibility or coma with skin of gray or greenish hue. Send for a surgeon at once.

Place the patient in a warm bed, or wrap him in blankets or coats. Keep his head low. Remove his clothing carefully and at once, cut if necessary to save delay. Bind up wounds and broken bones.

Apply heat, especially to the region of the heart, the pit of the stomach and to the extremities. Use bottles of hot water, rubber water-bags, hot bricks, or blankets and flannels wrung out of hot water, in fact anything hot that may be convenient. Wrap hot articles in blankets so as not to burn the skin. Apply heat along the inner sides of the arms and legs. Do not apply heat to the head. Give hot drinks, unless there is concussion of the brain, broken skull, compression of the brain, apoplexy, or severe bleeding.

Hot water, tea, coffee, broth or milk are the best stimulants. Do not give whisky, brandy, or other spirituous liquors. If patient is able to swallow give one-half teaspoonful of aromatic spirits of ammonia in half a cup of water every fifteen minutes for not more than four doses.

Relieve vomiting by placing bits of cracked ice in the patient's mouth.

In summer, let the injured person sip cold water if he is conscious.

Give nothing by the mouth in abdominal injuries.

BLEEDING

ARTERIAL.—(From the arteries.) Arterial bleeding is very dangerous and may destroy life in a few minutes. Arterial blood is bright red—scarlet—spurting. It flows away from the heart.

VENOUS.—(From the veins.) Venous blood is dark red or purplish, wells up freely without spurting, flows toward the heart.

CAPILLARY.—(From very small vessels.) Capillary blood is red—bright or dark. Slowly oozes. It is dangerous if continued. As a rule this is easily checked.

Summon a surgeon at once. Have the patient lie down, usually on his back. If the wound is in a limb, elevate it. Cut away clothing (following seams) to expose and examine the wound.

Apply pressure to the bleeding points with finger covered with gauze, and as quickly as possible substitute a pressure pad of sterile gauze.

First aid ends when the bleeding is stopped and the wound covered. Do not give stimulants until bleeding has stopped.

To **CONTROL ARTERIAL BLEEDING.**—Cover your thumb with several thicknesses of gauze and press directly on the wound, to stop bleeding temporarily. If the wound is large, cover with thick layers of gauze. Then apply pressure at a short distance above the spurting point, between the wound and the heart, using a tourniquet or Spanish windlass, the triangular bandage, a pair of suspenders, a piece of rubber tubing, or a rope. A tourniquet left on too long may induce gangrene. Any sort of tourniquet should be loosened at least once every thirty minutes to allow circulation to return; oftener if part becomes cold or dark. If bleeding starts, tighten again.

If a limb is badly crushed, put the pressure on the limb above the crushed tissues.

Fit the pressure bandage firmly before leaving it. After the bleeding has been stopped, remove the bandage slowly and apply another bandage that will not obstruct the circulation in the part.

BLEEDING FROM VEINS.—Lay a pad of dry gauze over the wound and bind up with a moderately firm bandage.

In severe cases have the patient lie down. Elevate the wounded part, loosen tight clothing, collars, waistbands and other constricting garments. Apply a pressure pad below the bleeding point, between

For treatment after bleeding has stopped, see section on Wounds and Bandaging.

the wound and the end of the extremity. Pad the wound with gauze, and bandage.

Cuts of the throat, involving the jugular vein, are the most dangerous. (See Bleeding from Special Parts.)

Ruptures of the varicose veins of the legs are common. In these, elevate the limb, remove garters, and bandage the leg firmly below the wound, and then place a small compress directly upon the opening.

BLEEDING FROM THE CAPILLARY VESSELS.—Oozing from wound occurs in nearly every variety of small wounds. Exposure to the air for a few moments will often allow clotting and check this form of bleeding. Hot water applied by means of squeezing out a mass of hot cloths is sometimes successful. (Warm water encourages bleeding.) Extremely cold water or a piece of ice also checks bleeding. Usually it is sufficient to apply a pad of gauze upon the bleeding part and to bind it tightly in place. If the bleeding be from the socket of a tooth, it may be controlled by packing the cavity with bits of cotton or gauze.

GENERAL TREATMENT.—In every form of bleeding keep the patient warm by artificial heat and clothing, hot water bags, etc.

When the bleeding has ceased give hot drinks, tea, coffee, milk, etc., and cautiously loosen the bandages if they are very tight.

Keep watch for recurrence of the bleeding. When it occurs, tighten the bandages or apply pressure directly as before.

Severe bleeding may cause fainting; this may temporarily check the bleeding. Treat as any other fainting spell. Lay the patient upon the floor or couch, lower the head, keep the limbs elevated, apply warmth to the body. Be ready to check the bleeding again if it should recur when consciousness is restored.

BLEEDING FROM SPECIAL PARTS

SCALP.—Press down directly upon the scalp near the edge of the wound, on the side from which the bleeding proceeds (Fig. 8), covering the hands with a piece of surgically clean gauze in order to avoid contaminating the wound. Make a permanent compress by folding gauze cloth into a hard pad and bind it firmly. (See Bandaging.)

TEMPLE.—Press with the thumb upon the bone just in front of the ear, to compress the artery. (Fig. 6.)

Make a permanent compress by means of a piece of plain gauze

Never wash away blood clots; bind them up.



Fig. 3—To arrest bleeding from arteries of the cheek



Fig. 6—To arrest bleeding of the temple



Fig. 4—To arrest bleeding of the neck



Fig. 5—Course of the main arteries of the face, neck and scalp



Fig. 7—To arrest bleeding of the upper part of the arm or armpit

folded in the form of a pad, and hold it in place with a roller or triangular bandage. (See Bandaging.)

FACE.—Press firmly against the jaw bone with the thumb. (Fig. 3.) Control bleeding of the cheek and lips by passing the thumb into the patient's mouth and grasping the cheek, just below the



Fig. 8.—To arrest bleeding of the scalp. Pressure applied directly to the bleeding point with the thumb, the thumb covered with clean cloth or gauze.



Fig. 9.—To arrest bleeding from the cheek. Pressure applied to the artery by placing the thumb inside the mouth and the finger outside.

wound, between the thumb and the fingers, thus compressing the artery leading to the wound. (Fig. 9.) Bind a folded piece of gauze as a permanent pad compress. (See Bandaging.)

NECK.—Stab wounds, cut throat or other wounds of this region require prompt attention. Without an instant's delay, grasp the patient's neck. (Fig. 4.) Put the thumb into the wound and press the wounded vessels straight back against the spine and not against the wind pipe. Continue the thumb pressure until assistance arrives. In urgent cases do not substitute a pad for the finger.

ARM.—If the arm is not entirely severed, roll a towel about a bottle or other hard round substance, or tie a hard knot in a towel, and crowd it into the armpit. A roll of newspaper, or stick of wood, or



FIG. 10.—Flexion of the arm at the elbow to arrest bleeding. A piece of wood or hard substance thrust in the space of the elbow. The arm may be fastened in this position.



FIG. 11.—Elevation of the arm with the hand grasping a stick or other substance.



FIG. 12.—Compression to arrest bleeding of axillary artery (armpit). A piece of wood or book thrust into the space and the arm bandaged to the side.

other hard substance covered with sterile gauze may be utilized. (Fig. 12.) Then bring the arm to the side and fasten firmly with the bandage. If the bleeding is in the armpit make pressure with a pad of sterile gauze directly upon the bleeding point. If the arm is severed, press upon the artery on the first rib just back of the collar bone, with the thumb or fingers (Fig. 7) or with a padded key.

Heat is best applied to inner part of arms, legs, etc.

Arterial bleeding in the arm may be checked as described above, or pressure may be applied, as shown in Fig. 16. A Spanish windlass tourniquet, or a bandage applied to the arm (Fig. 18) with a wad or pad covering the wound, may be used in addition, or to relieve the pressure.

FOREARM AND WRIST.—Raise the forearm above the head. (Fig. 11.) In addition to the pressure on the wound, or above it, place a hard object, such as a small bottle or stick, in the front of the elbow, then bend the forearm at the elbow and bandage firmly to the upper-arm. (Fig. 10.)

PALM OF THE HAND.—Raise the arm above the head. Have the patient grasp some small hard object like a billiard ball or smooth stone covered with sterile gauze. The pressure may be made permanent by binding the hand firmly while in this position. (Fig. 11.)

FINGERS.—Raise the arm above the head. Apply pressure to the hand or wrist by binding with a cord or a rubber band. No violent pressure is needed.

CHEST AND ABDOMEN.—Apply pressure upon the wound itself. If available take a yard of surgical gauze, crumple it up and press it into the wound until the surgeon arrives, or keep it in place by applying a firm bandage around the body.

BLEEDING FROM THE LUNGS.—(Blood bright red, sometimes light coffee color.) Lay the patient down with head and shoulders raised.

Summon a surgeon at once. Keep patient absolutely quiet and cool, applying cold wet cloths to the chest.

Give finely chopped ice, mixing some salt with it if available.

BLEEDING FROM THE STOMACH.—Blood, dark coffee color. Give ice water or broken ice with a teaspoonful of vinegar, repeating the dose at intervals. Summon a surgeon at once.

INTERNAL BLEEDING.—Lay the patient upon a bed or couch without a pillow, with the head slightly lower than the body. Apply ice-cold cloths to the abdomen. A surgeon should always be summoned.

BLEEDING FROM THE TONGUE.—If severe, apply pressure as for bleeding of the arteries of the neck. Let the patient suck ice or sip very hot water.

BLEEDING FROM THE NOSE.—Apply cold cloths or cracked ice over nose and at the back of the neck.

Have patient sit erect with head dropped slightly forward.

Do only what is absolutely necessary.

Pinch nostrils together and hold for a few minutes.

A simple method is placing under the upper lip a small wad of cotton or gauze and applying pressure up against the nose.

If bleeding persists take a narrow strip of gauze and crowd a small portion at a time into the nostril, pushing it well up into nose with a pencil or penholder until a tight plug is produced. Keep plug in nose several hours, and when bleeding has stopped remove carefully so as not to renew the bleeding.

If bleeding is excessive or continuous, summon a surgeon. :

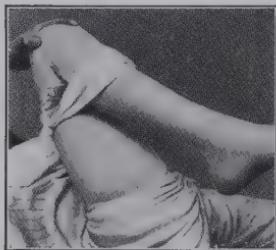


FIG. 13.—Flexion of the knee to arrest bleeding in the leg or foot. A piece of wood to be inserted under the knee, the leg bent back upon itself and fastened with a bandage.



FIG. 14.—To arrest bleeding of the leg or foot. The limb elevated and pressure applied by means of a bandage.

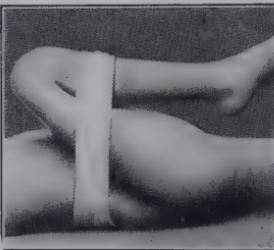


FIG. 15.—Flexion of the leg to arrest bleeding in the thigh. A stick or knotted cloth placed in the groin and the leg bent double back upon the abdomen and fastened with a bandage.

THIGH.—Thigh wounds require prompt attention. Exert pressure upon the inner surface of the thigh just below the groin, or where the artery of the thigh (femoral artery) comes out of the body, about two-thirds of the way from the knee to the hip-joint. (Fig. 21.) This can be effected with the thumbs, a rounded stick, a key handle, or a Spanish windlass. (Fig. 19.) To control the artery, place a knotted cloth or a large round stone in the groin, doubling the leg back on the thigh (this is important); press the thigh up against the abdomen; finally, hold it there with a bandage. (Fig. 15.)

A piece of elastic tubing (gas tubing) or a pair of suspenders passed around the limb several times, stretched at each turning and made tight, is often effective. Draw only tight enough to control bleeding.

LEG BELOW THE KNEE.—Apply firm pressure in the hollow just behind the knee above the calf of the leg. Place a stick under the knee and double the leg back until it presses hard against it. Flex on the abdomen or the bending of the knee will soon become painful. (Fig. 13.) Pressure may also be applied as shown in Fig. 14.



Fig. 16—To arrest bleeding of the upper arm



Fig. 17—Course of the main arteries in the arm and shoulder



Fig. 18—Spanish windlass applied to the arm



Fig. 19—Spanish windlass to arrest bleeding of the artery of the thigh



Fig. 20—Course of the main arteries of the leg



Fig. 21—Hand-pressure to arrest bleeding in the leg or thigh

SPANISH WINDLASS.—This is a rough but effective method of controlling bleeding in the arms or legs, and should be used only where other methods fail or cannot be carried out. Its construction and application are shown in Figs. 18 and 19. Use only as a temporary expedient in an emergency and for no longer time than is necessary to check the bleeding. Remove and substitute a flat pad.

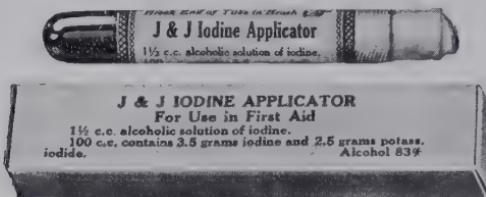
BLEEDING FROM THE FOOT.—Apply pressure to the bleeding point, or to the arteries at the ankle joint. If this fails, use flexion of the knee. (Fig. 13.)

WOUNDS

Summon a surgeon. Place the patient in a comfortable position while the wound is being examined and dressed. Stop the bleeding. (See Bleeding, pages 11-17.) Cover the finger with surgical gauze or lint whenever possible before touching the wound.

In machinery, railroad and other accidents, every wound is likely to become contaminated with dirt and foreign substances, which hinder the healing of the wound. Do not attempt to cleanse the wound if the services of a physician can be obtained. It is safer, as a rule, to bind up the wound temporarily, dirt and all, than to touch it with unclean hands. Cover the wound as quickly as possible with absolutely clean materials, that is, surgically clean.

IODINE ON WOUND.—The tincture of iodine is useful as an application to wounds for the prevention of infection. Ordinarily it is



used in the form of the tincture as purchased in the drug stores, reduced with alcohol to a strength of two or three per cent. (Iodine for first aid use may be purchased in tubes with a swab attached.)

Swab ordinary wounds gently with the iodine solution on a small roll of cotton, gauze or other swab, wiping off any excess. Apply it as soon as possible after the injury to the raw surface only.

In cases where there is grease or other foreign substances, the wound may be cleaned with gasoline or benzine.

Always cover the hands with several folds of surgical gauze or lint before touching the wound.

Pick dirt, bits of grass or clothing, splinters of wood, fishhooks, pins or thorns out of the wound with tweezers or pincers that have been boiled.

If the wound is covered with grease, soot, or dirt, cleanse it with a piece of surgical gauze moistened with turpentine or benzine.

If necessary to flush the wound, make some weak suds with an antiseptic soap and boiled water. Dip a wad of absorbent cotton into

Avoid touching an open wound with the hands.

the suds and hold it a few inches above the wound. Squeeze it so as to cause a stream to trickle gently over the wounded surface. This will wash away the dirt. Do not mop the wound.

Before replacing any of the torn portions of the wound, cover your hand with surgical gauze or lint, as with a glove.

Dress wounds known to be infected, after they have been cleansed in the manner suggested, as follows:

Lay several thicknesses of sterile gauze over the wound. Cover this with a layer of absorbent cotton, and bind the whole with the triangular bandage or with the ribbon roller bandage. (See Bandaging, pages 39-52.)

No one but a surgeon should ever attempt to stitch a wound.

Use adhesive plaster only for very small wounds or in special cases where its use seems imperative.

In most cases, the parts may be drawn together with the ribbon bandage, and over this the dressings applied.

Do not bandage a wound too tightly unless it is necessary to stop bleeding.

After bandaging, keep the injured part in a position of comfort.

If the head is injured, make the patient lie down with his head resting upon a pillow or cushion covered with a clean towel.

If the forearm is injured, bring it across in front of the chest and support it in a sling.

If the leg be wounded, it may be supported upon a cushion or blanket.

In wounds of the chest, raise the head and shoulders until the patient is able to breathe comfortably.

If the abdomen be wounded, place the patient on his back, with his knees drawn up.

LACERATED WOUNDS.—These are quite common in machinery and railroad accidents. They are also caused by missiles, such as stones, or bricks, or by falling upon sharp stones and broken glass.

In cases of this sort, bleeding is not often excessive. When the services of a surgeon cannot be secured, cover the wound immediately with clean dressings. Then place the patient in a comfortable position to await the arrival of the surgeon, or to be transported.

PIERCED OR PUNCTURED WOUNDS.—These are caused in war by bayonets, swords and similar weapons, and in civil life by needles, thorns, fishhooks, bits of glass, splinters, and other articles.

The simplest treatment is the best. Unless an object like a needle

can be easily removed, leave it until the arrival of a surgeon. In pulling out the needle or other object examine it to see if it is complete. If any portion of it has been left in the wound, do not try to remove it, but inform the surgeon.

In case of thorns, nails or other objects, which tend to poison the wound, swab with iodine. Cover with sterile gauze and bind with a bandage.

To remove a splinter or other object imbedded in the flesh, take an ordinary penknife, boil the blade in water for ten minutes, or



FIG. 22.—Method of removing a splinter.

pass it once or twice through the flame of a lamp. Cover the fingers with sterile gauze. Slip the point of the penknife under the end of the splinter or other object, and catch it against the blade with the thumb and nail and draw it out. (Fig. 22.)

Fish hooks and arrows usually do not penetrate deeply and should be pushed through the tissues, never drawn back unless the barbed point has been cut off.

Gunshot wounds should be treated like other wounds. First check the bleeding, if it is severe, and make the patient as comfortable as possible. No better dressing can be used for gunshot wounds than the contents of the First Aid Packet.

BRUISES.—To slight bruises apply lint or surgically clean plain gauze, folded and dipped in water. Apply hot water to severe bruises.

In very severe cases involving shock, apply warm blankets, hot bottles, hot flat-irons covered with cloth, in fact, anything hot or warm, covered so as not to burn the skin. Give hot drinks, preferably coffee. Do not give alcoholic drinks.

After a wound has been bandaged, do not uncover it. If it bleeds, put on more bandages.

POISONED WOUNDS

SNAKE BITE.—Don't stop to kill the snake. Tear open the clothing to expose the wound quickly. Put a handkerchief, strap or rope around the limb above the wound. Draw it just tight enough to stop circulation. Better still, tie it loosely and then twist it as shown in Figs. 18 or 19.

Lay open the one or two holes made by the snake's fangs with the tip of a knife blade. Pass the blade down into the wound and cut outward; cut lengthwise rather than around the limb. Be careful not to cut an artery, but if severe bleeding occurs stop it by pressure. Make the blood run from the knife cut. Rub the wound with the finger to dislodge any of the tenacious poison which remains. An oft-practiced and successful plan is to suck the wound, to extract the poison; there is no danger from the poison taken into the mouth, but it must not be swallowed. Wash the wound with whisky if you wish, but do not give whisky to the sufferer.

Take the patient to a surgeon as soon as possible.

If a surgeon cannot be procured wash the wound with water, or if possible to secure the material, fill the wound with common baking soda or permanganate of potash moistened with water.

Do not release the pressure bandage for several hours except by the order of a surgeon. When the pressure is released it should be done gradually, and only for a few moments at a time to relieve pain, and then slightly retightened.

BITES OF DOGS.—Make the wound bleed freely. Apply tincture of iodine to wound.

If the dog has been sick, the wound may be sucked, after cleansing. Do not kill the dog. Wait to learn if he has rabies.

Cases of hydrophobia are very rare but serious. In all cases of dog bite summon a surgeon and take his advice.

Bites of rats, cats and other animals are less dangerous than those of dogs. Clean the wounds well with an antiseptic soap and apply tincture of iodine. Summon a surgeon.

STINGS OF SCORPIONS, CENTIPEDES, TARANTULAS.—Apply ammonia at the point where the sting entered, then apply cold water or ice and summon a surgeon.

As a rule, a stinging insect leaves its sting in the wound. This should be forced out, if possible, by pressing on the skin at its side with a knife blade.

The stings of ordinary insects, such as spiders, mosquitoes, etc., should be wet with a solution of table salt or ammonia. Cold water or alcohol may also be applied.

THE CARE OF WOUNDS

Instructions used by F. C. Warnshuis, Chief Surgeon of the Pere Marquette Railroad Company:

From 75 to 80 per cent of all wounds and abrasions become infected if untreated.

The little scratch or bruise when the skin is broken may result in a severe case of blood poisoning, the same as would a big cut or severely torn tissue.

Wounds heal very fast if they are clean and kept clean. When we say clean we mean not only clean of dirt but also clean of invisible germs. These germs lie on the skin and often on a tool or any object that causes the injury. When these germs are not cleaned out of the wound AT ONCE and destroyed, blood poisoning and infection may result.

Whenever any employee sustains a wound he should pursue the following course:

Report immediately to your foreman or superior, who will cause you to receive proper care for your injury.

If you sustain an injury and are at a distance from First Aid, immediately cover it with sterile gauze, clean linen and a bandage.

Do not put anything on or into the wound or bathe it with water or any solution.

The sooner you cover a wound, the less danger will there be of infection.

Never use shop rags, waste or a used handkerchief for cleansing or covering a wound.

For minor injuries wipe off the grime and dirt with gasoline. Then pour over and into the wound pure tincture of iodine and cover with sterile gauze or linen and bandage.

After cleansing immediately cover the wound with clean sterile gauze, and bandage.

Keep it covered until healed.

In severe injuries cover the wound at once with clean sterile gauze, and bandage, and report to the doctor.

Never use on any wound soap, water, salves, peroxide, powder, iodoform; and never use dirty rags, waste, handkerchiefs, soiled cloths or towels—use only clean sterile cotton, linen or gauze, and bandage.

Never attempt to prick or open any blister or wound that you may have received. Go to the company's doctor. Never remove a bandage or a dressing that a doctor has put on, no matter how dirty the outside may become. Go to the doctor to have your dressing changed.

Do not give stimulants in sunstroke.

FRACTURES—BROKEN BONES

SIMPLE FRACTURE.—A break of the bone without wound or injury of surrounding structures.

COMPOUND FRACTURE.—A break of the bone where there is a wound or opening through the flesh to the fracture.

TREATMENT.—Place the patient in as comfortable a position as possible, supporting the injured portion upon a pillow, a cushion or a pad of cloth or other material.

If clothing is to be taken off remove it from the sound part first, being careful to avoid giving pain to the patient by unnecessary handling. Cut the clothing in the seams, if possible.

Handle a fractured limb as carefully as you would a piece of rare china. Do not attempt to set the bone.

First aid workers should learn, under the guidance of a physician, how to apply a gentle traction while handling a fractured part.

In a simple fracture, when a physician cannot be obtained, treat the patient at the spot where found, if possible. When it is necessary to move the patient to any distance, lay the limb upon a cushioned splint, and apply a bandage to keep the parts quiet and in such a way as to prevent the fragments of bones moving upon one another.

In compound fractures before applying the splints, treat the bleeding and dress the wounds with sterile gauze, covered with absorbent cotton and wrapped with a triangular bandage. Apply a splint as in a simple fracture, being careful not to bandage too tightly.

SPLINTS.—Use the chest as a splint for the arm by fastening the arm to the side with a wide roller bandage or with the triangular bandage. The uninjured leg will make a good temporary splint for a broken leg. In order to support a broken limb properly, the splint must extend above and below the injury so as to keep the joints and fragments quiet. The width of a splint should be a little greater than the thickness of the injured limb. Cushion the surface of the splint which is to come next to the limb with some soft and elastic materials or ordinary cotton.

In many cases it is better to have two splints, one on each side of the limb, both held in place by the same bandage. Small splints may be cut from cigar boxes, pasteboard boxes, book covers, laths, shingles, flour or sugar barrel staves, broom or mop handles. Even fire-tongs, pokers, shovels and desk rulers have been employed. Cover

Bind up the wound before applying a sling or splint.

well with soft paper, or preferably, with absorbent cotton, lint, or gauze.

In the shop or factory, tools and their handles, umbrellas, canes or parasols, may be used. (Fig. 23.) In the absence of these, bunches of twigs from bushes, heavy folds of paper, straw or stiff grass may be utilized. In the army, soldiers utilize bayonets, swords, ramrods, rifles and other articles for temporary dressing so that the injured person can be carried to a hospital.

Apply the triangular bandage folded as a broad or narrow cravat, or a roller cotton bandage, to hold the splints in place. If these are

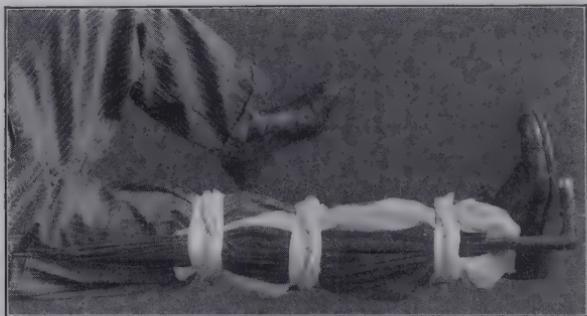


FIG. 23.—Splint made with umbrella.

lacking, pocket handkerchiefs, towels, garters, suspenders, cords or straps may be used.

In applying a splint, the help of a second person should be obtained to support the limb while the dressings are being adjusted. In fixing a splint avoid causing pain or bandaging the part so tightly as to interfere with the circulation of the blood. Leave the tips of the fingers or toes uncovered so that they be seen and felt to ascertain if their circulation is good. In raising a broken limb support it above and below the injury, so that there is no bending of the limb at the point of injury. Bending causes pain and some tearing of the soft parts.

In applying splints to the upper part of the body, let the patient be seated on a chair, the assistant, if there is one, working from behind the patient.

When it is necessary to move the patient to any distance, lay the limb, if it be the lower leg, upon a wooden splint and exert gentle

To send for a physician is of first importance.

traction upon the injured limb, keeping the toes pointed upward. While traction is rendered, splints should be applied to the limb and bandaged in place.

SLINGS.—The triangular bandage or roller bandage can easily be made into a sling to support a broken limb. (See Bandaging.)

When bandages are lacking utilize the sleeve as a sling for the arm by pinning it to the breast of the coat. (Fig. 24.)

Two handkerchiefs form an excellent sling. The first should be tied around the neck as loosely as possible, the second tied about the



FIG. 24.—Sling made with the sleeve of a coat.



FIG. 25.—Sling made with two handkerchiefs.

first in the same manner, and the arm slipped through it. (Fig. 25.)

FRACTURE OF THE SKULL.—Send immediately for a surgeon. Place the patient in a convenient shady place on his back with head and shoulders slightly raised. Convey to a hospital as soon as possible.

If there is an open wound, make a pad or compress of sterile gauze and bandage loosely over the wound. If there is any evidence of fever, apply cloths wet with cold water, or bags of ice, to the head. Place a piece of flannel under the ice bag so as not to freeze the scalp.

FRACTURE OF THE NOSE.—Check bleeding by plugging the nostrils with cotton or gauze. Put small pad of gauze on each side of nose and place strip of adhesive plaster across nose from cheek to cheek, or carry roller bandage lightly across and around head. Consult a surgeon.

FRACTURE OF THE JAW.—Put the bones gently into place and raise lower teeth to upper. If any teeth are knocked out or loosened save them for the surgeon. He may restore them. Apply bandages as illustrated. (Figs. 74-75.)

FRACTURE OF THE COLLAR BONE.—In fractures of the collar bone, the affected shoulder drops. The injured person usually supports

the elbow and forearm with his free hand, so as to relieve the weight of the limb from the broken bone. Lay the patient on his back on a hard, flat hair mattress or settee, with a folded blanket under injured shoulder, without any pillow, until the surgeon arrives.

Cover any wound present with gauze, loosely held in place. Before moving the patient place a moderate sized pad of gauze or soft cloth in the armpit and bandage the arm to the chest. Let the forearm hang in a sling.

FRACTURE OF THE SPINE.—Send for a surgeon at once. Lay the patient flat on his back. Do not disturb him unless absolutely necessary. Moving him may prove fatal. If necessary to move, raise him carefully without bending the spine and slide a splint beneath him. When absolutely necessary to move the patient before the arrival of a surgeon, use the “broken back” splint shown elsewhere. Turning a patient in this condition to one side, or on his face, may prove fatal. Apply hot blankets to the body, if the patient is cold.

FRACTURE OF THE SHOULDER BLADE.—Bandage the arm to the side as in a fracture of the collar bone.

Protect any bruises with sterile gauze and a bandage.

FRACTURE OF THE RIBS.—Move the patient as little as possible. Raise his head and chest to make breathing easier. He may lie upon the uninjured side or on his back, or may stand up. If the patient is spitting blood give him bits of ice to suck.

Apply a wide roller cotton bandage carried around the chest several times, or several triangular bandages placed so as to extend several inches below or above the injury. Before bandaging gently press the palm of the hand on the chest wall. If this affords relief bandaging will do good; if painful, bandaging must be omitted.

Before applying the first bandage, have the patient, with arms raised above his head, take in a deep breath and then let it out (exhale) so as to almost empty the lungs. Bandage the chest while it is deflated.

BROKEN THIGH.—Send for a surgeon at once. Lay the patient on his back, or a little inclined toward the injured side. Raise the head and shoulders slightly. Gently draw the leg out straight by exerted traction, keeping the toes pointed upward.

Cover any wound with sterile gauze. Prevent movement of the fractured bone. Apply a splint, using a board, broom handle, musket or other rigid object that will extend from below the foot to the armpit. Pad the splint. Fasten the splint by bandages above and below the

break, about the knee and ankle and one about the waist. (Fig. 26.) Apply an inner splint also from the crotch to foot, or in its absence, bandage the injured limb to the sound one.

FRACTURE OR CUT OF THE KNEE-PAN.—Do not bend the leg. Place the patient on his back with the injured leg somewhat elevated upon pillows. Cover any wound with sterile gauze. Make a pad about three inches thick out of paper or a towel wrapped in sterile gauze or lint. Place this pad in the hollow at the bend of the knee. Place a similar pad on the under part of the heel. Prepare a splint long



FIG. 26.—Dressing for dislocation of left hip. This dressing is made by using two six-foot splints held together by three cross pieces, to which is fastened a triangle made of three-foot splints. Place the patient on this splint, being sure to pad where needed. Fasten the patient securely with folded triangular bandages after placing the injured leg in the most comfortable position.

enough to reach from below the heel to the thigh under the leg. Bind the splint at the ankle and the thigh, and also above and below the knee. (Fig. 27.)

FRACTURE OF THE LEG BELOW THE KNEE.—Lay the patient on his back. Draw the leg down straight and place it on a soft pillow or cushion, with the toes pointing upward.

Cover any wound with sterile gauze. Place a padded splint made of boards or sticks on each side of the leg, extending from the ankle joint to above the knee joint, and bandage firmly. If a splint is not at

hand, use a pillow or cushion made by stuffing a bag with straw or cotton. (Fig. 28.)

BROKEN JOINTS.—Breaks near the joints are very serious and need extreme care. Bend or move the joint as little as possible. Apply light splints on all sides of the joints.

Lay the limb on a pillow. Swab any wound with iodine, cover with sterile gauze held in place with a bandage.

FRACTURE OF THE FOOT.—Make a right-angle splint (Fig. 29), padded well with cotton or lint, and bandage to the side of the foot. Bandage another splint on the sole of the foot.

BROKEN UPPER ARM.—Place a pad of folded lint in the armpit

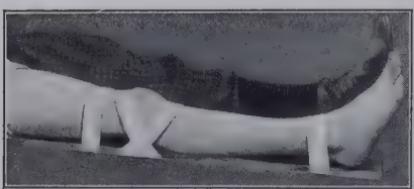


FIG. 27.—Splint for fracture of knee-pan; may be fastened with adhesive plaster or bandages.

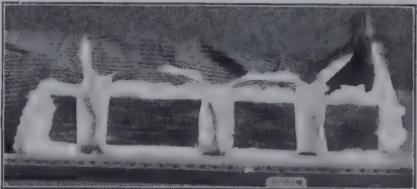


FIG. 28.—Splint made of padded boards.

extending under the arm. Draw the elbow down to the side. Bind the upper arm to the side of the chest with the triangular, or wide ribbon bandage. Place the forearm in a sling, so arranged that the hand is slightly higher than the forearm. For a fracture in the middle of the upper arm apply four narrow splints on all sides of the arm. Secure by roller bandage and place the forearm in a sling. (Fig. 30.)

FRACTURE OF THE FOREARM.—Place the forearm across the chest, the palm of the hand turned in and the thumb pointing upward. Place padded splints on the outer and inner sides of arm from the elbow to below the wrist. (Fig. 31.) Bandage the splints and place the arm in a sling.

FRACTURE OF THE WRIST.—Apply a well padded splint made of pieces of wood, cigar boxes, pasteboard, tin, wire or other material. The pad should extend from the finger tips well up to the forearm on the inner side of the hand. Place a similar pad upon the back of the hand and wrap the whole wrist smoothly in a bandage before applying the splint. Hang in triangular bandage sling. Get the patient in hands of physician quickly.

FRACTURE OF THE HAND.—Make a splint from thin wood, cigar boxes, pasteboard or any stiff material, long enough to extend from the finger tips to the forearm. Pad this splint well and apply it to the palm, taking care to have a thick wad of padding in the palm.

Bind the splint in place and put the arm in a sling, with the hand slightly higher than the elbow.

FRACTURE OF THE FINGERS.—Make a splint of cardboard or any suitable material, sufficiently long to extend from the tip of the finger



FIG. 29.—Splint for foot made of two pieces of board.

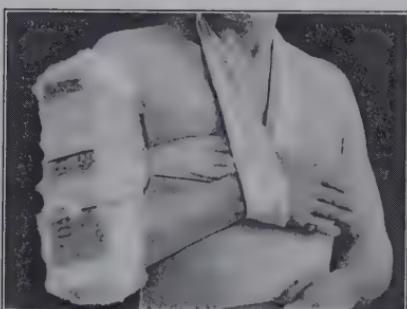


FIG. 30.—Splint and bandage for fracture of upper arm.

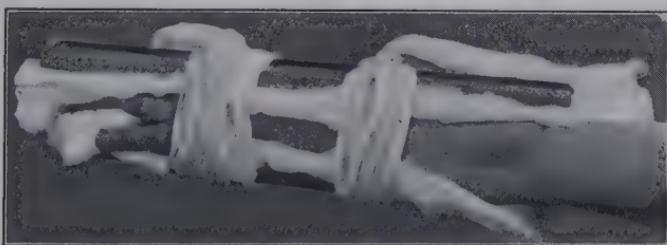


FIG. 31.—Splint for fracture of forearm.

up to the wrist. Pad the splint with cotton and bind it firmly in place. Support the hand with a small sling.

SUGGESTIONS ON FRACTURES

Never attempt to handle the patient until the limb has been rendered immovable.

Support and splint the injured limb at once to prevent further movement.

Straighten the limb with great care.

If shortened, hold the foot or hand until the limb regains a more normal length.

Keep the patient warm so as to lessen the effects of the shock.

In doubtful cases treat as a fracture.

BURNS AND SCALDS

Three degrees are generally recognized:

Simple reddening of the skin,—first degree.

The formation of blisters,—second degree.

Charring of the skin, up to complete destruction of the part,—third degree.

Burns of the second and third degree, especially when involving large areas, require immediate medical attendance. In severe burns there is liability to shock and prostration.

When a person's clothing catches fire, make him lie down immediately. Throw him down if necessary. Wrap him quickly in a blanket, cloak or shawl, preferably some woolen material, and smother the fire by pressing and slapping upon the burning points from the outside, beginning at the head, and then dash on water.

After placing the patient in a place of safety, remove clothing by cutting it away with knife or scissors. If the clothing sticks, do not pull it off, cut around it and leave it for the surgeon to remove.

Burns are intensely painful. Contact with air increases the pain. Expose only small areas at a time and dress them promptly so as to exclude the air.

Do not expose the burn to heat, though warm moist cloths are sometimes grateful, especially if wet with a warm solution of baking soda (bicarbonate).

In cases of severe shock it is heroic but satisfactory treatment, when possible, to lay the patient on a sheet and lower him, clothes and all, into a bath tub of moderately warm water. This will relieve the pain and shock.

Cover slightly burned or scalded places with pieces of lint dipped in baking soda solution (one teaspoonful baking soda to one pint boiled water); cover this with absorbent cotton and finally wrap with the triangular or roller bandage.

In more severe cases, saturate lint with perfectly fresh salad oil, olive oil, sweet oil, vaseline or petrolatum. In the absence of these use the white of an egg. Carron oil (equal parts of raw linseed oil and lime water), while not the most antiseptic remedy, is useful for emergency treatment. Laeking oils, dust the burned part with starch, flour or toilet powder. Cover the whole area with a layer of lint, a layer of absorbent cotton, and finally wrap with a triangular bandage.

See Bandaging for method of applying Splints and Slings.

A dressing for burns of all classes which is in accredited use is pieric acid gauze. This gauze allays the pain, is slightly antiseptic and has been adopted as more satisfactory than the previously used oil and solution dressings. Pieric acid gauze should not be used with ointments.

Pieric acid gauze is obtainable in cartons and bottles, also in especially prepared first aid for burns packet, described elsewhere in this Manual.

The regulations governing the Workmen's Compensation Law of the



FIG. 32.—Dressing for burns of head, neck, ears and face made with pieric acid gauze and covered with cotton.



FIG. 33.—Completed dressing of burns as shown in Fig. 32. Two triangular bandages have been used, with the base around the neck; one at the front and the second at the back and the ends tied around the neck and the points tucked in.

State of New York prescribe a burn dressing ointment containing three per cent of bicarbonate of soda in petrolatum.

For burns of the second and third degree a wax dressing known as Redintol has been used successfully. It is described elsewhere in this Manual.

Burns from caustic lye, strong ammonia and similar substances should first be flooded thoroughly with water and then with vinegar, and then treated as if caused by fire.

Burns from acid, vitriol and similar fluids should first be flooded with water and washed with a solution of baking soda or lime water. If nothing else is available, take chalk, tooth powder or a portion of mortar from the wall, crush it and stir it up with water and apply on lint to counteract the acid. After washing, treat as a burn by fire.

Burns from carbolic acid are relieved if quickly washed with full strength alcohol.

If acid gets into the eye, bathe the eye with water, and then flush with lime water. Milk or boracic acid solution may be used.

In the case of burning of the lips and mouth by an acid use a weak solution of washing or baking soda.

Burns of the inside of the mouth or throat are caused by drinking hot fluids or swallowing chemicals. Apply oil or the white of an egg, by making the patient drink it or by pouring it from a spoon into the throat. In the case of burns by caustic potash, ammonia and the like, rinse the mouth and throat with weak vinegar.

In case of scalding of the mouth and throat by steam, sometimes happening to children, wrap the patient in a blanket, summon a physician, apply hot flannels to the throat. Administer small doses of equal parts of cod liver oil and lime water.

If a fragment of lime gets into the eye, do not try to take out the lime but quickly flush the eye freely with water and bathe it with very weak vinegar or with lemon juice, a teaspoonful of either to a cup of warm water. Castor oil dropped into the eye will give relief.

Burns from gunpowder are to be treated in the same way as ordinary burns.

Burns by electricity or lightning are to be treated in the same way as burns by fire.

SUN BURNS.—Treat as a mild scald, covering with a weak solution of baking soda, oils, vaseline, cold cream or white of an egg, then with lint and bandage.

MACHINERY AND RAILROAD ACCIDENTS

The preceding pages fully cover the forms of injury usually met with in industrial accidents.

These accidents are frequently the occasion of very severe wounds, such as the wrenching off of arms and legs, fingers or toes.

Nearly all wounds are crushed, ragged, mangled and torn. Fractures are frequent.

In railway service we find severe burns and scalds.

Railway accidents often occur at places and at times when aid or appliances are not at hand.

Intelligent first aid finds one of its greatest opportunities in emergencies of this character.

* The first aid worker should thoroughly master the method of handling the accidents liable to occur in his own industry. In acci-

dents of this class it is necessary that some person take full charge and direct all operations.

Convey the injured to a place of safety away from the crowd, and give plenty of fresh air. Shock almost always follows accidents of this character. (See Shock.)

Severe bleeding is not usual in these accidents as the wounds inflicted are such that the blood vessels are generally closed. Treat small wounds, whether cuts or tears, by the methods suggested elsewhere.

The following specific directions are those issued by Dr. F. C. Warnshuis, Chief Surgeon to the Pere Marquette Railroad Company:

1. For bruises and small minor injuries not requiring immediate attention of a doctor, pursue the following course:

Clean the injured part thoroughly with gasoline or benzine, using plenty of time and a clean piece of linen. Cleanse the skin all round the wound and then wash or clean out the wound itself, thus removing all grease and dirt.

Paint or pour into the wound and on the surrounding skin tincture of iodine; this kills the germs.

Cover with sterile gauze, clean linen and bandage. (Never use shop rags, waste, liquid court plaster, powder, salves or any other substance or solution.)

2. If the injury is severe do nothing but cover it with clean linen or gauze and bandage it. Control bleeding by tourniquet or pressure above the injury. If the bone is broken put on an external splint made of any firm substance.

3. Send the injured one to the company doctor at once, or call the company doctor.

4. At all times keep on hand bandages, gauze, iodine and benzine. These supplies are sufficient for first aid to any injury.

5. Endeavor to cover every wound in the shortest time possible after it has occurred. Never use soap, water or any other solution. Use clean gauze and bandage exclusively.

CRUSHED HANDS AND FEET.—Wrap the site of the injury first in gauze, several thicknesses, laid on rather loosely.

Bind loosely with bandages. Over this lay one or two thicknesses of surgical gauze and enclose the entire part in a triangular bandage. If the hands or feet have been torn off, place the limb in a position where the injured part is higher than the rest of the body.

CRUSHED ARMS OR LEGS.—Do not disturb the clothing except to cut it away from the injury to get at and to control the bleeding.

Wrap the injured part first with several thicknesses of gauze laid on rather loosely. Bind this in place with bandages. Over this lay

one or two thicknesses or sheets of absorbent cotton and wrap the whole with the triangular bandage.

CRUSHED CHEST.—Crushes of the chest or lower part of the body allow but little chance for relief, but place the patient in as comfortable a position as possible, usually upon his back.

Cover all wounds with gauze and over this place layers of gauze and cotton. Apply warmth and give moderate stimulation.

Be careful not to touch the wound with the bare hand while applying a bandage.

Handle large wounds, tears or lacerations carefully.

Put the torn parts in position without touching them with the hand. This may be done by using tweezers or forceps, first cleansing the instruments in boiling water or soap suds.

Cover the wounds first with several thicknesses of sterile gauze, cover the gauze with absorbent cotton, bind this on with gauze bandages and finally wrap with the triangular or the ribbon cotton bandage. If a splint be required, apply it after the wound is covered.

In cases of pain, contusions, bruises, etc., apply cold or hot cloths (whichever are the more comfortable) near the injured part.

Do not apply cold in the case of severe bruises, or to old persons. In all cases elevate the parts and put at rest.

CRUSHED FINGERS AND TOES.—Mold gently into shape. Do not handle them with the bare fingers. Use layers of surgical gauze as a glove. Even if a finger or toe hangs by a mere thread, or is entirely severed, put it back in place as quickly as possible. The surgeon may save it.

Cover the wounded part with gauze, and bind with a ribbon gauze bandage (not too tightly).

Lay over all one or two thicknesses of absorbent cotton and wrap the whole with the triangular bandage. Splint if necessary.

MINING ACCIDENTS

The Bureau of Mines of the Department of the Interior, U. S. A., has made the following statement as to the character of injuries met with in the working of mines:

"Records of miners' hospitals show that more than half of all miners who are hurt have been caught under falls of rock, coal or ore, and more than one-fourth have been injured by cars or mine locomotives. Miners are

For method of applying splints and slings, see Bandaging.

injured also by mishandling powder and by electricity or machinery, by being overcome by mine gases and bad air, or by being burned by gas that has been ignited. A study of 6,719 non-fatal injuries to miners shows that out of every 100 injuries about 30 are to the legs, about 8 to the back, about 11 to the feet, about 8 to the arms, about 14 to the hands, about 5 to the shoulders, about 4 to the hip bones, about 6 to the head and about 4 to the face. Hospital records show that out of every 100 injured men who go to the hospital, about 43 have broken bones, 15 have some part of the body crushed, 11 are badly bruised, and about 10 have open wounds. The remainder have dislocations, sprains, burns and other injuries."

Thus it is evident that the first aid man in mines must be ready to treat fractures, crushes, burns, electric shock, as well as considerable range of other injuries.

One of the greatest dangers associated with mine accidents is the very frequent occurrence of suffocating gases. It is accordingly quite important that the men associated with rescue work in mining accidents should be thoroughly drilled in the transportation of the injured. From this, however, it must not be inferred that an injured person must at once be removed from the place where he lies injured. The injury should always be cared for before the patient's removal if the surrounding conditions permit.

Suffocation from gases calls for instant removal to fresh air and the establishment of artificial respiration. Mine gases are dangerous, and accordingly the removal of a man from a gaseous chamber is not an easy task. The workers must be trained, strong, brave and cool. Before entering the chamber in which the accident occurred they must determine whether they can safely do so. If there has been a fall of the roof, they must await the cessation of all rumbling noises for fear that another fall may ensue, imperiling their lives also. It is obvious that the rescue party can give no assistance by entering a chamber filled with noxious gases, unless they are equipped with some satisfactory form of respirating apparatus.

Transportation methods are described elsewhere in this Manual.

Many mining companies have installed extensive rescue and first aid systems, which are often organized with the cooperation of the State or the Federal Bureau of Mines. These bodies issue numerous leaflets devoted to safety, rescue and first aid work in mines which the first aid worker would do well to obtain. Mining companies have in numerous instances established first aid corps who are trained in rescue and first aid work.

If a finger or toe has been cut off, put it back in place and quickly bind it up.

The handling of injuries occurring in mines is the same as directed in this Manual for injuries of like character.

Burns from explosions are frequent. In mining practice by preference these are covered with picric acid gauze. This gauze is found in the Burn Dressing Packet described in the Manual, and may be procured in separate containers.

In many instances first aid supplies and rescue apparatus are kept at accessible points within the mine, as well as at the mouth of the shaft.

It has been the practice in certain mines for each miner to carry with him a First Aid Packet, or its equivalent.

The suggestions which here follow are those which have been shown by active experience to be of prime importance.

WHAT TO DO AT ONCE WHEN A FELLOW MINER IS HURT

Be calm and remain so.

If he is under a fall and you can not remove him, go for help.

Send for the boss; send for the first aid team and first aid supplies; send for the stretcher; see that the doctor is called.

Take charge and give orders until the boss comes.

Find where the man is hurt before trying to move him. If you believe that a bone is broken or there is a wound or that hemorrhage has started, remove the clothing over the part injured to make your examination.

Don't try to pull off clothing; cut or rip clothes if they must be taken off.

If his back is hurt, *don't move him* until you have help or the doctor comes.

Always place the injured man on his back, with his head lower than the rest of his body (unless he is bleeding freely about the head); open his collar and loosen his belt. Place clothing or cushion under his back to keep it warm.

Always look for bleeding, and if the blood is bright red and coming in spurts, try to stop it at once.

Don't give an injured man brandy or whisky or any stimulants while he is bleeding; keep him quiet and warm.

If any bones are broken, put on splints before moving him. If you are in doubt as to whether the bones are broken, always put on splints.

If you find that he has no broken bones and is not bleeding or spitting blood, but is very pale and is cold and breathes fast, *keep him quiet*; lay him on his back, lower his head, cover him with brattice cloth, clothing, blankets, or the like; place safety lamps, if they are used in the mine, under covers near him as an aid in keeping him warm; do not let others crowd around him, but give him plenty of air. Before moving a patient see that there are no pieces of rock or coal tangled in his clothing.

Never attempt to remove pitch, varnish or wax from a burned surface.

Never put a patient in a car to ride out of a mine. Take time to carry him.

The following has been issued on authority of the Bureau of Mines, Department of the Interior, U. S. A.:

THINGS TO DO AFTER A COAL MINE DISASTER

1. Summon assistance from the nearest mines.
2. Notify the state inspector and rescue crews.
3. Organize your forces and assign duties.
4. Look after the fan and repair it immediately if it has been damaged.
5. Place guards at all entrances to keep a record of all happenings.
6. Ascertain whether natural ventilation is established at any openings.
7. Procure permissible safety lamps and electric hand lamps for persons who are to explore the mine.
8. Shut off electric power on the trolley, power and light wires entering the mine except those used for operating the fan.
9. Procure brattice material or order it for immediate delivery.
10. Have a crew of men enter openings that have intake currents of air and look for men who may be injured or overcome near the entrance.
11. Call as many doctors as are available.
12. Procure portable fire extinguishers and have them ready for immediate use in case a fire is discovered.
13. After a disaster in a shaft mine, get the hoisting appliances in the downcast compartment in condition for use by the explorers.
14. Keep on hand at all times a dozen safety lamps in good condition for emergency use.

THINGS TO DO AFTER A METAL MINE DISASTER

1. Keep the air compressors running to capacity as long as there is any hope that live men may still be in the mine.
2. Summon assistance from the nearest mines.
3. Notify the state mine inspector and all available rescue crews, including those of the Bureau of Mines.
4. Immediately organize your forces and assign duties.
5. If there is a fan look after it immediately if it requires repairs or changing.
6. Place experienced men to guard all entrances and keep a record of all happenings.
7. Procure necessary materials and supplies.
8. Have a crew of men equipped with candles and canary birds enter openings that have intake currents of air and look for men who may be injured or overcome near the entrance.
9. Call as many doctors as are available.

See Wounds and Bandaging.

10. Procure portable fire extinguishers and have them ready for immediate use in case a fire is discovered.
11. After a disaster in a shaft mine get the hoisting appliances in the downcast compartment or shaft in condition for use by explorers.
12. Shut off electric power, except those circuits used for operating fans; or for hoists and pumps, if it is necessary to operate them.
13. Station experienced men at all openings to observe the condition of air currents and to note any changes.
14. Perfect the surface organization before starting underground.



FIG. 34.—Home-made sanitary stretcher for use in mines, etc. Constructed of three-fourths inch iron pipe covered with six-inch bandages.

THINGS TO BE NOTED IN AN ACCIDENT WHEN SENDING FOR THE DOCTOR

When a person receives an injury in a mine, or elsewhere, and is thereby rendered unable to walk, considerable time elapses while he is being removed to his home. Much valuable time can, therefore, be saved by forwarding a message in advance to the doctor. It should contain details of the injury in the following order:

- 1.—Part of the body injured: head, chest, abdomen, legs or arms.
- 2.—Right or left side, above or below knee or elbow.
- 3.—Whether bleeding or not.
- 4.—Conscious or unconscious.
- 5.—Most particularly, correct name and address of person injured.

FIRST AID BANDAGING

Two kinds of bandages are available for first aid work. They are known as the roller bandage and the triangular or handkerchief bandage. Both of these may be purchased at drug stores, or in an emergency they may be made on the spot. These bandages as purchased are made of surgical gauze or of muslin.

The bandages made of surgical gauze are absorbent, thin and very pliable. They are most suitable for placing next to a wound,



FIG. 35.—Esmarch's Triangular Bandage.

or as agents for the application of fluid to the part. Cotton or muslin roller bandages are much stronger than those which are made of gauze, and are therefore more suitable where pressure or support is desired. In an emergency, however, these bandages are interchangeable.

Except in great urgency bandages should not be improvised, as the material usually at hand cannot be made to take the place of clean, surgically prepared material.

Only when it is absolutely necessary should bandages be pieced, as pieced bandages are rough and may exert undue pressure upon the parts treated.

THE TRIANGULAR BANDAGE

The Triangular or Esmarch Bandage is made by cutting a piece of cloth thirty-six inches square into two pieces diagonally. Such a bandage can easily be improvised, but is also obtainable from drug-gists. The triangular bandage has proven of the greatest value in emergencies, upon the field of battle and elsewhere. It is simple, efficient and of wide usage. It is probable that no other article used in wound dressing can accomplish so much, and in such a reliable manner as this triangular bandage in rendering first aid.



FIG. 36.—Showing points at which to fold triangular bandage. For broad bandage bring the point over to the edge and fold once. For a narrow bandage bring the point to the edge and fold twice.

The illustrations shown in Fig. 35 are printed on the triangular bandage found in Johnson's First Aid Packet. It is recommended that every user of this Manual shall obtain one of these illustrated triangular bandages and familiarize himself with its use. This can best be done by actual application of the bandage itself.

The triangular bandage is susceptible of many applications not shown in the illustrations. These will suggest themselves to the user. The bandage may be used either as a "broad" or "narrow" bandage.

The broad is made by spreading the bandage out, then bringing the point down to the lower border, and folding once.

The narrow is made by drawing the point down to the lower border, and then folding twice.

For the forehead, side of head, eye, cheek or any round part of the body (as the arm or thigh) the narrow bandage must be used, its center being placed on the wound, and the ends carried around and tied.

The bandage should always be fastened either with a pin or by a reef-knot. (Figs. 40 and 41.) The so-called granny-knot should never be used. It is applied to the body as follows:

TO THE SCALP. (Figs. 37 and 38.) Fold a hem about two inches deep along the lower border. Place bandage on the head so that the hem lies on the back of the neck with the point drawn over the forehead. Then carry the two ends around the head above the ears, and tie in a reef-knot on the forehead. The point can then be drawn up and pinned at the top of the head.



FIG. 37.—Folded triangular bandage to apply pressure to the top of the head.



FIG. 38.—Triangular bandage for the scalp.



FIG. 39.—Folded triangular bandage to apply pressure on artery and to hold pad in place on forehead. Useful in bleeding, etc.

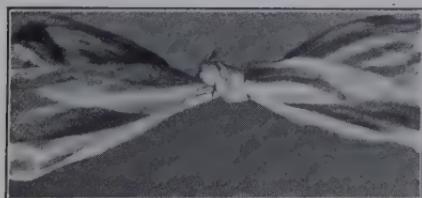


FIG. 40.—Ends of triangular bandage tied into a reef-knot.



FIG. 41.—Reef-knot.

The reef-knot, often called a surgeon's knot, or the flat knot, when used to tie the bandage ends will hold the dressing in place without slipping, may be untied easily and quickly, and being flat and soft will not cause pressure to the body.

The granny-knot, often called round knot or hard knot, will usually slip, and being hard and round is not easily untied, and may cause pressure to the body, especially if under a splint.

In applying this bandage care must be taken to put the hem close down to the nape of the neck, to carry the ends above the ears, and to tie the ends close down to the eyebrows, not high up on the forehead.

For the eyes or front of the face the narrow bandage is folded about the head at the middle line of the face with the ends tied in a reef-knot.

FOR THE NECK.—Use the narrow or broad bandage as may be required, tying on the side opposite the injury. (See Figs. 42 and 43.)



FIG. 42.—Triangular bandage for back of neck.



FIG. 43.—Triangular bandage for the neck.



FIG. 44.—Triangular bandage for fracture of jaw, using two bandages folded very narrow.

FOR THE SHOULDER.—Place the center of a bandage on the injured shoulder, with the point running up the side of the neck. Carry the ends around the middle of the arm and return and tie them on outside. Take a second bandage, fold it into a broad bandage, place one end over the point of the first bandage, and make a sling for the arm by carrying the other end of the bandage over the sound shoulder, and tying at the side of the neck. Bring the point of the first bandage under the part of the sling resting on the injured shoulder, draw it tight, turn it down and pin it.

FOR THE CHEST.—(Figs. 48 and 49.) Place the middle of the bandage on the injured side, with the point over the shoulder. Carry the two ends around the waist and tie them. Then draw the point over the shoulder and tie to one of the ends, or extend with a piece of roller bandage.

FOR THE BACK.—The bandage is applied as above, but its application is begun by placing it on the back.

Let safety be the first consideration, then first aid.

In injury to the ribs it is best to use two broad bandages, applying one well under the armpits and the other one directly below, tying each at a point opposite the injury.

FOR THE FOREARM AND WRIST.—Bind with a broad cravat and support the arm in a sling.



FIG. 45.—Eye dressing—folded triangular bandage, gauze pad and roller bandage.

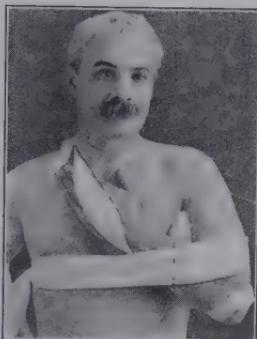


FIG. 46.—Dressing for fracture of left collar bone—pad in armpit, two triangular bandages.



FIG. 47.—Shoulder dressing held in place by triangular bandage.



FIG. 48.—Triangular bandage applied to chest. Back view.



FIG. 49.—Triangular bandage applied to chest. Front view.

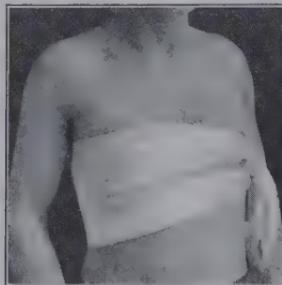


FIG. 50.—Dressing for fracture of ribs—two triangular bandages with pad under the knot.

FOR THE HAND.—To cover the whole hand, the triangular bandage is spread out and the hand laid upon it with the wrist at the lower border and the fingers toward the point. The point is carried back toward the fingers. The ends are brought about the wrist, crossed, brought back and tied. (Figs. 51 to 54.) This makes a very effectual and complete bandage for the whole hand and a support for all the fingers.

LARGE ARM SLING.—(Fig. 58.) Spread out a bandage, put one end over the shoulder of the uninjured side and let the other hang down in front of the chest. Carry the point behind the elbow of the injured arm, and bend the arm forward over the middle of the bandage. Then carry the second end over the shoulder of the injured

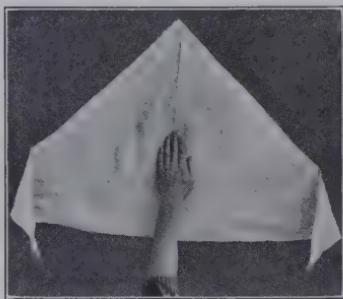


FIG. 51.—Triangular bandage dressing for hand. First move.

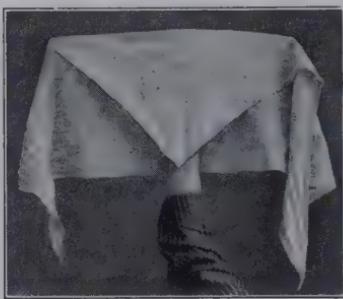


FIG. 52.—Triangular bandage for hand. Second move.



FIG. 53.—Triangular bandage for hand. Third move.



FIG. 54.—Triangular bandage for hand. Completed bandage.

side, and tie it to the other end. Bring the point forward and pin it to the front of the bandage.

SMALL ARM SLING.—Two triangular bandages are folded into the broad form, the ends tied together and placed around the neck in

"The fate of an injured man depends on the care first given to his injury."—Esmarch.

such a way as to make two loops; one loop supports the forearm, and the other the hand. (Fig. 56.) A wider sling, consisting of one loop, is made of triangular bandages or two handkerchiefs. (Fig. 57)

FOR THE HIP.—(Fig. 63.) Pass a narrow bandage around the body above the haunch-bones, tying the knot on the same side as the

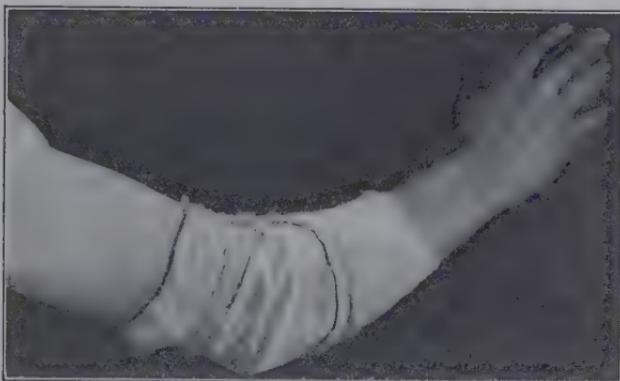


FIG. 55.—Triangular bandage for holding dressing on elbow.



FIG. 56.—Sling made of two pieces of six-inch bandage (or two triangular bandages). Tie ends together and place around the neck so as to make two loops.



FIG. 57.—Sling made of triangular bandages, or two handkerchiefs.



FIG. 58.—Triangular bandage, broad sling for left arm.

injury. Take another bandage, turn up a hem according to the size of the patient, place its center on the wound, carry the ends around the thigh, and tie them. Then carry the point up under the waist-band, turn it down over the knot, and pin it.

Send for a surgeon. While waiting, make the patient comfortable.

FOR THE FOOT.—(Fig. 59.) Spread out a bandage, place the foot on its center with the toe toward the point, draw up the point over the instep, bring the two ends forward, cross, and tie them around the ankle.

For the Thigh, Knee and Leg the cravat bandage may be used.



FIG. 59.—Triangular bandage applied to foot to hold dressing in place.



FIG. 60.—Triangular bandage applied to heel.



FIG. 62.—Triangular bandage applied to knee.

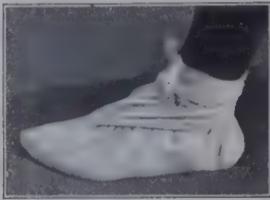


FIG. 61.—Triangular bandage for foot.



FIG. 63.—Triangular bandage for the hip.

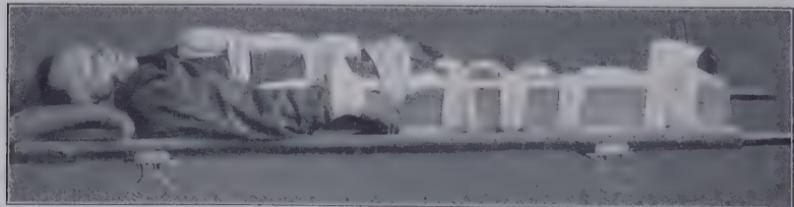


FIG. 64.—Dressing for fracture of thigh made with triangular bandages and padded splints. Sling made by tying ends of bandages together. Useful when patient is weak.

THE ROLLER BANDAGE

Roller bandages as supplied by druggists are made of muslin cloth known as Cotton Roller Bandages and of surgical gauze cloth, known as Gauze Bandages. Such bandages can be procured in widths of 1, 1½, 2, 2½, 3, 3½ and 4 inches. Roller bandages made of gauze are supplied in ten-yard lengths. The cotton roller bandages are supplied in five-yard lengths.

The roller bandage is easily applied, and while experience is



FIG. 66.—Method of handling roller bandage.



FIG. 67.—Method of applying roller bandage spirally, beginning with slow spiral turns.



FIG. 68.—Method of reversing or folding back turns of the spiral roller bandage.

necessary, with a little practice any layman may make an application that will answer in any emergency.

To apply a roller bandage, begin by holding the extremity at the point at which it is to start with the thumb and index finger of the left hand. Hold the roll of bandage in the right hand and turn this hand in the direction taken by the hands of a clock, unrolling the bandage and at the same time turning it around the part to be enclosed. Make the first turn with the right hand, after which the left hand, being freed by the overlapping, may alternate with it.

The simplest form of application of a roller bandage is a direct circular turn around the part beginning at the end of the limb or

other part. Where the part is larger at one end than the other (for example, the forearm from the wrist to the elbow), circular turns do not lie smoothly. In such cases begin at the small end, making a few turns each over the other, and then move the turns up the limb spirally, making the spirals overlap each other about one-third their width.

When the bandage begins to pucker, turn the edge so as to make an inverted V and carry around the part overlapping the preceding



FIG. 69.—Roller bandage for elbow joint; begin bandaging at forearm.



FIG. 70.—Roller bandage for hand, wrist and forearm; begin bandaging at hand.

turn, and so on, repeating the process until the whole part is covered. (Figs. 67 and 68.)

At the joints—elbow, knee, ankle—the roller bandage may be applied so as to form a figure 8, the bend of the joint forming the crossing part or middle of the figure 8, with loops above and below the joint. (Fig. 69.)

In applying a roller bandage care must be used as to the amount of tension to be employed. Surgeons use the expressions "tight," "moderately tight" and "loose." These degrees may be estimated by applying a bandage to one's own person. A tight bandage around the hand causes it to throb. A moderately tight bandage around the fingers gives the support of a comfortably fitting glove. A loose bandage is one that may be applied to the eye without discomfort. As a general rule, bandages around the fleshy part of the arm and



REFERENCE TO FIGURE 65

- A. Roller bandage for the head and jaw
- B. Roller bandage for fracture or wounds of the chest
- C. Roller bandage for upper arm
- D. Triangular bandage and splint
- E. Roller bandage for wounds of hip and thigh
- F. Triangular bandage for hand
- G. Roller bandage for knee
- H. Roller bandage for toe and foot
- I. Triangular bandage for foot

Fig. 65.—Method of applying Triangular and Roller Bandages

the thigh may be applied with more force than those on other parts of the body. In applying a bandage to the entire limb a slight increase of pressure may be applied at each turn of the bandage from the beginning. When the roller bandage is used to hold dressings or splints in place, more pressure may be used than if it is applied directly to the limb itself.

In bandaging the hand or foot, the tips of fingers or toes, with a roller bandage, the nails should be left uncovered unless they have been injured, in order to make sure circulation is not impeded. If the nails are bluish in color the bandage should be loosened.

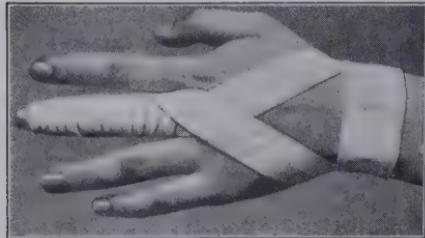


FIG. 71.—Roller bandage for the finger; begin at the wrist.



FIG. 72.—Figure-of-eight roller bandage for the thumb; begin at the wrist.



FIG. 73.—Roller bandage for the toe; begin at the foot.



FIG. 74.—Roller bandage for the head and jaw.



FIG. 75.—Roller bandage as a sling for injuries of the chin.

The tip of the elbow or the heel should not be covered unless injured.

Bandages applied over thick layers of gauze or cotton can be made tighter than those applied where no other dressing is employed. It should also be noted that a limb bandaged when elevated, will,



FIG. 76.—Roller bandage for back of hand and wrist; begin at wrist.



FIG. 77.—Roller bandage for fracture of shoulder. First step.



FIG. 78.—Roller bandage for fracture of shoulder. Finished bandage.



FIG. 79.—Roller bandage for fracture of ribs or wounds of the chest or abdomen.



FIG. 80.—Roller bandage for wounds of shoulder or armpit.

when lowered or extended, distend and increase the pressure. When a bandage is started at the ankle and passed on to the extremity of the foot and then returned to the ankle, the first winding should be very loose. Allowance should be made in bandaging for any shrinkage which may occur as a result of the wetting of the bandage by discharge from the wounds or bleeding.

Aged persons and children should be bandaged only loosely.

In applying bandages to the chest, breathing should not be hindered.

To secure the end of a roller bandage, pins or strips of adhesive plaster may be used. The end of the bandage may be slit into tails and carried around the part in opposite directions and tied. If a pin is used, it should always be directed downwards and appear to view at least twice through the layers of muslin, its point being buried in the bandage.

SIZES OF BANDAGES

Roller bandages vary in width and length according to the use for which they may be desired. The following sizes are those most frequently used.

Bandages for the hand, fingers and toes—1 inch wide, 1 to 2 yards in length.

Bandages for the head, arms and legs of children— $1\frac{1}{2}$ or 2 inches wide, 6 yards in length.

Bandages for the arms, legs and extremities of adults— $2\frac{1}{2}$ inches wide, 7 yards in length.

Bandages for the thigh, groin and trunk—3 inches wide, 8 to 10 yards in length.

RULES FOR APPLYING THE ROLLER BANDAGE

Fix the bandage by taking one or two turns round the part.

Bandage from below upwards and from within outwards over the front of the limb.

The pressure must be equal throughout.

Each succeeding turn should overlap two-thirds of its predecessor.

Keep the margins parallel and all crosses and reverses in one line.

See that the part is in the position in which it is to remain after being bandaged.

When "reversing" make all the "reverses" downwards and on the outer side of a limb.

See that the bandage is tightly rolled up before commencing.

In taking off a bandage gather the slack in the hand.

End by fixing the bandage securely.

FIRST AID EQUIPMENTS

The greatest danger from wounds comes from their contamination with foreign substances, not always visible, but far-reaching in effect. Certain invisible irritating matters (called germs) quickly find lodgment in the wound by transference from the air, the clothing, skin, in fact from anything that may come in contact with it. In consequence of such contamination blood-poisoning, gangrene, inflammation, fever, erysipelas, lock-jaw or tetanus, and a train of other complications are apt to follow any wound. Even scratches and pricks, when not properly cared for, may result in inflammation and the formation of gatherings or abscesses, which may disable a person for a considerable time, and cause the loss of a limb, or even of life.

The modern practice of first aid requires that the dressings to be applied to a wound shall not only look clean, but actually be surgically clean (aseptic), and free from infection or surgical dirt.



In order to extend the beneficial effects of the modern methods of caring for wounds to every one who may have the misfortune to be wounded, Johnson & Johnson have devised a system of first aid, of which this Manual is the text-book.

The dressings to be used in this system may be found in the equipments described in the following pages. They may also be purchased

separately from druggists in all localities. Their timely application will mean the saving of many lives and limbs and the prevention of a great amount of suffering. The use of these simple appliances will also prevent the employment of wrong measures of relief. From lack of knowledge, dirty rags, chewing gum, tobacco, cobwebs, dirty oils, stimulating liniments and spoiled salves are, by well-meaning persons, applied to wounds with disastrous results.

In the use of the dressings supplied in these outfits, a surgically clean dressing of the best type may be applied at once. The instructions given for the prompt use of the materials are scientifically correct, and the methods of first aid to the injured are based upon the highest principles of humanity. It is, therefore, only natural that this system has received the special endorsement of thousands of railroad, mining and factory surgeons, as well as of those connected with fire, police and municipal departments.

The various equipments are so arranged and the contents so selected that temporary aid can be rendered by any layman, and when the surgeon arrives he will find proper material for the first dressing of any injury. The dressings are simple and complete, and the contents are not only applicable to injuries of any nature, but in the larger Cabinets are sufficient in quantity to provide for a large number at one time.

JOHNSON'S FIRST AID CABINET No. 1

Many thousands of these Cabinets are in use in factories, mines, camps, ships, railway and trolley lines, railway shops, schools, office buildings and other places where accidents are liable to occur.

The dimensions of this Cabinet are: Length, 20 inches; width, 13 inches; depth, 3½ inches; weight, 12 pounds. The Cabinet is made of heavy decorated japanned metal, with strong hinges and fasteners, hangers to hang Cabinet against the wall, and convenient handles for carrying.

CONTENTS

Two First Aid for Wounds Packet No. 3.

Two Burn Dressing Packet No. 22.

Four packages Red Cross Absorbent Gauze, each containing one yard.

Two packages Red Cross Absorbent Cotton, each containing four ounces.

One spool Johnson's Z O Adhesive Plaster, 1 inch wide, 5 yards long.

Twelve Red Cross Cotton Roller Bandages, assorted widths.

Eighteen Linton Gauze Bandages, assorted widths.

One Tourniquet. One jar Carbolized Petrolatum.

One bottle Camphenol. One bottle for Camphenol Antiseptic Solution.

One bottle Aromatic Spirits of Ammonia.

Four wooden splints, 3½ x 18 inches. Two packages safety pins.

One pair scissors. One pair tweezers. Sample Synol Soap.

One Johnson's Standard First Aid Manual.

The Cabinet also has a supply of accident report blanks for use in reporting accidents to the superintendent or other authority, blanks for checking supplies and ordering refills, and an illustrated chart showing uses of Triangular Bandage, etc.

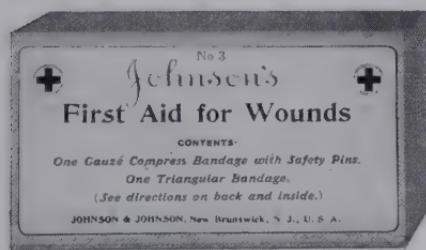
The interior of the Cabinet is so partitioned and the contents so packed that they are kept in good order and are readily accessible. Simple directions for the use of the various articles are printed upon the inside of the cover, and in each Cabinet a Johnson's Standard First Aid Manual is enclosed, giving explicit directions for the treatment of injuries before the arrival of the surgeon.

DESCRIPTION AND USES OF THE CONTENTS

FIRST AID FOR WOUNDS PACKET No. 3.—This packet is modeled after the famous First Help for Wounds packet used successfully in recent wars, and by all of the first aid and humane societies throughout the world. It is particularly adapted to factory work injuries. The contents are as follows:

One Gauze Bandage with compress attached. This bandage is for application to open wounds, for compression, for binding dressings and other purposes.

One Triangular Bandage, with illustrations showing mode of use. Two safety pins. The whole is wrapped in an impermeable covering, enclosed in a cardboard carton, sterilized and sealed.



In military campaigns, in mining, forestry and camping, each person usually carries one of these packets in his pocket.

The value of the dressings in this packet has been well established, and it has been shown that they can be applied by any person without handling the wound, and that the dressing is just what is needed—an antiseptic, sterile dressing. In most instances the dressings found in this packet are sufficient for all purposes until the arrival of a surgeon.

The directions upon each packet apply particularly to open wounds, burns, scalds or injuries of a similar nature.

It is difficult to imagine a wound or an injury which cannot be completely or properly dressed by the use of this First Aid for Wounds Packet. One or two packets are sufficient for the temporary dressing of a most extensive injury.



RED CROSS GAUZE (PLAIN).—The material, as its name indicates, is a thin, soft, woven cloth. For the purpose of covering a wound directly this gauze is, as a rule, a proper material to use. It is surgically clean (aseptic), absorbs very readily, contains no foreign matter, is soft and soothing and will form



an easy, comfortable pressure and absorb all discharges and exudations. Each one of the packages contains one square yard of surgical gauze, and this is used either whole or cut into suitable sizes or folded for making compresses, for covering large exposed surfaces, for applying dressings or solutions to

burns or wounds. It may be adapted to innumerable conditions and circumstances.

In applying a gauze dressing it is always well to fold the gauze in such a way that there will be a number of layers of gauze over the wounded part. For a small wound the gauze should be folded so as to form a pad one-eighth of an inch thick. For a large wound an increase in the number of layers should be made in proportion. After applying the gauze, a roller or triangular bandage should be used to hold it in place.

Where there is considerable oozing of blood, layers of absorbent cotton should be laid on top of the gauze pad before the application of the outer bandage.

ABSORBENT COTTON.—It is scarcely necessary here to dwell upon the wide range of absorbent cotton as an application to injuries of any sort. It is by far the most used of all materials either for covering wounds, for making compresses, for padding splints, for slings, or for absorbing discharges. Several forms of dressing, in which absorbent cotton forms a component part, are given in this Manual. A typical dressing for an open wound is as follows: Next to the wound, if it is clean, place layers of gauze. Above this, according to the amount of discharge or oozing expected, place layers of absorbent cotton, and bind with a roller cotton bandage or the triangular bandage.



LINTON GAUZE BANDAGES.—These bandages are absorbent, soft, and at the same time firm and strong. They are intended to be used as a direct covering for the wound. Their absorbency is useful to hold wound discharges. They are also useful in binding and holding other dressings and for the application of solutions and lotions to the wound. These gauze bandages are tightly rolled, and each bandage packed in a cardboard cylinder.

Special uses of the bandages are given in this Manual (see Bandaging).

COTTON ROLLER BANDAGES.—These are ribbon-like strips of cotton cloth and are wound into cylinders.

They are strong and can therefore be used for binding up injuries in any part of the body.

In general, these bandages are used to keep other dressings in place, to secure splints, to check bleeding, to protect the parts from external injury, to bind up fractures—in fact, their uses are innumerable, and they may be said to be applicable to nearly every sort of injury.

Persons of ordinary intelligence can satisfactorily apply a roller bandage. Methods of application adapted to ordinary emergencies are described under the heading of "Bandaging" in this Manual.

Z O ADHESIVE PLASTER.—This plaster is applied without the aid of heat or moisture. It is supplied in ribbon form, compactly wound on a spool. Z O Adhesive Plaster should be used instead of court or isinglass plaster as an application to wounds.

The uses of adhesive plaster are too numerous and commonplace to mention. Some of its important applications in emergencies have been detailed in this Manual. When the services of a surgeon can be secured, and when the injuries are extensive, a layman should never attempt to apply adhesive plaster to a wounded surface. In trifling injuries, or in cases where the patient cannot reach a surgeon for some days, adhesive plaster may be used by a layman.

In applying adhesive plaster to a broken surface, the hands of the operator should be made clean by washing with antiseptic soap.

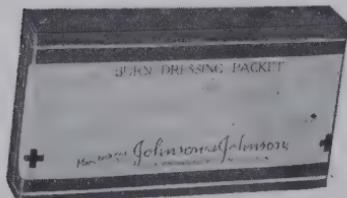
The wound should never be entirely covered with adhesive plaster. The best method is to bring the surfaces together with narrow strips, leaving a space between each two strips for the wound to discharge.

No large, open or raw surface should be covered with adhesive plaster. It should never be applied to burns.

Adhesive plaster is useful for holding dressings in place when the patient is to be transported. It can be made to form a covering and protection for wound surfaces, and to close torn or cut wounds. In small injuries it is often the only application needed.



BURN DRESSING PACKET No. 22.—This packet for burns holds four pieces of pueric acid gauze, each about 18 inches square, and also an illustrated triangular bandage with two safety pins. It is absolutely complete in itself and offers a thoroughly reliable, efficient and speedy specific burn dressing. Contents tightly compressed and sealed in a strong carton, ready for use. (See Burns.)



Burn Dressing Packet No. 22.

CARBOLIZED PETROLATUM.—The chief use for which this article is placed in Johnson's First Aid Cabinet is as an application to burns. The method of use is to cover the burned surface entirely with it, so as to exclude the air, and then to wrap the part thoroughly with surgical gauze. It is superior to oils and ordinary emollients by reason of its anti-septic properties.

TOURNIQUET.—This simple device is designed to stop the profuse flow of blood from severed arteries in severe injuries to the limbs. It consists of a strong tape fastened to a wooden handle. The tape is to be wound once about the limb (between the heart and the injury) and passed through the slit in the handle, then under the handle. The handle is then twisted until sufficient pressure is applied to the artery to stop the blood spurt. The tourniquet should not be allowed to remain in place longer than is required to stop the blood flow, then loosened.

CAMPHENOL SOLUTION.—This is an antiseptic for wounds. A small bottle of Camphenol is supplied in the Cabinet. By placing one teaspoonful of Camphenol in the large empty bottle provided, and filling the bottle with water, a solution is derived of the proper strength for washing wounds and making an antiseptic dressing. Full directions for use accompany the Camphenol bottle.

As elsewhere stated in this Manual, it is required that the naked, unclean hands should never come in contact with open wounds. Whenever possible, the hands of the person doing the emergency dressing should be thoroughly washed with soap and hot water and soaked in a solution of Camphenol made according to the directions on the bottle.

Emergency dressings may be rendered antiseptic by dipping gauze or cotton in Camphenol solution and wringing out the excess fluid.

AROMATIC SPIRITS OF AMMONIA.—There are occasions when the giving of a light stimulant is advisable, and for emergency use nothing is equal to aromatic spirits of ammonia. The dose is half a teaspoonful in half a glass or less of water and repeated in fifteen minutes if necessary, but not more than four doses. Stimulants, however, are only to be administered under the conditions stated in the Manual, or by direction of the physician.



Tape Tourniquet

WOODEN SPLINTS.—Four splints are included in each Cabinet so no delay need surround providing these sometimes urgently needed necessities. For uses see Fractures.

JOHNSON'S STANDARD FIRST AID MANUAL.—A cloth bound copy of this Manual is supplied with every First Aid Cabinet No. 1.

The case also contains safety pins, scissors, tweezers, Synol Soap for cleansing the hands, etc.

There is included report blanks, blanks for checking and ordering supplies, and hanger showing uses of triangular bandage.

The Manual and the Cabinet form a complete system of first aid.

NOTE.—Cabinet No. 10.—To meet the requirements of Compensation Laws of certain States (such as New York State), as well as to meet the recommendation of Insurance Boards, Cabinet No. 10 is furnished, containing in addition to the foregoing articles the following:

OINTMENT OF BICARBONATE OF SODA AND PETROLATUM.—For application to burns.

BORACIC ACID SOLUTION.—For eye irritations and injuries.

IODINE SOLUTION.—For application to fresh wounds.

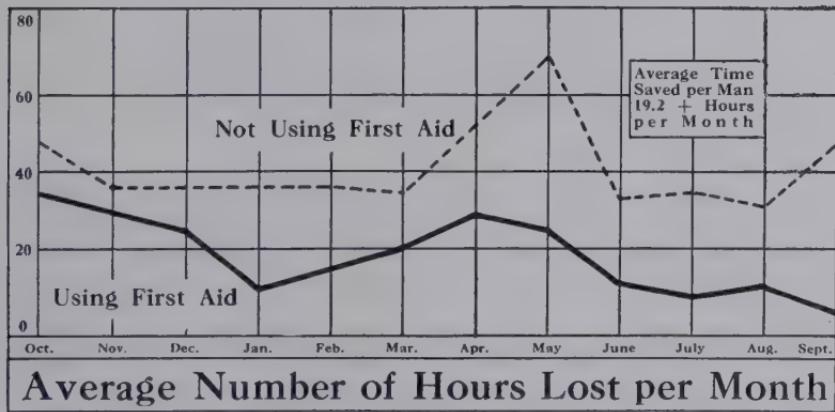
WOODEN APPLICATORS WOUND WITH COTTON.—For application of solutions to the eye after painting parts with iodine, etc.

TONGUE DEPRESSORS.—For use in choking, drowning, etc.

CASTOR OIL.—For application to the eye in the removal of foreign bodies and injuries to the eye.

MEDICINE GLASS.—For administering aromatic ammonia, etc.

FIRST AID PUTS THE INJURED BACK ON THE JOB QUICK



The above chart, compiled by Dr. W. Irving Clark at the Norton Company Works, Worcester, Mass., proves that the time lost in the repair of the employee depends upon prompt first aid. First aid puts the man back on the job quicker. Proper materials to dress the hurt prevents serious consequences. Upon the physical efficiency of every member depends the general efficiency of every manufacturing plant. Accidents interfere with the general working program. To obtain the proper spirit of service workmen must be safeguarded before and after the accident.

ACCIDENT OUTFITS



Household Accident Case
No. 11.

HOUSEHOLD ACCIDENT CASE NO. 11

This contains dressings for wounds and hurts from accidents apt to occur in any household. The articles in this Household Accident Case are so simple that any intelligent person can apply them, and there is sufficient material to last a long time for household purposes. A Handbook of First Aid, supplied with each outfit, tells what to do and how to do it.

CONTENTS:

- One ounce Red Cross Absorbent Cotton.
- One Tube Carbolized Petrolatum.
- One Yard Red Cross Plain Gauze.
- One Ounce Lint.
- Five Linton Gauze Bandages (in cylinders), assorted widths.
- Three Mustard Leaves.
- One Cylinder Zonas Adhesive Plaster, 1 inch.
- One First Aid for Wounds Packet No. 3.
- Finger Gauze Bandages.
- Safety Pins.
- Sample Synol Soap and Toilet and Baby Powder.
- Handbook of First Aid.

AUTOMOBILE EMERGENCY CASE No. 8

This is a small outfit, compact and sufficient for automobile equipment. It is made of strong metal, measuring $6\frac{5}{8}$ x $4\frac{3}{4}$ x $1\frac{1}{8}$ inches.

CONTENTS:

- One First Help for Wounds Packet, No. 3.
- One Yard Aseptic Gauze.
- One 2-inch Gauze Bandage.
- One one-inch Roller Cotton Bandage.
- One Cylinder Zonas Adhesive Plaster.
- One Tube Carbolized Petrolatum.
- One pair Scissors, one pair Tweezers, Safety Pins.



Automobile Emergency Case No. 8

WOOD'S EMERGENCY CASE, No. 6

This case is designed for the home, camp, launch, or automobile, or, in fact, wherever a compact, durable and convenient accident outfit is desired. It is made of black japanned metal, size, $7\frac{1}{2} \times 9 \times 3$ inches, and has a hinged cover with a secure fastener.



Wood's Emergency Case No. 6.

CONTENTS:

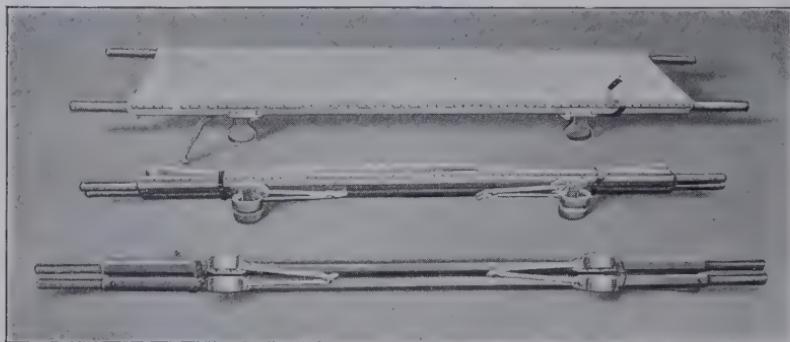
- One First Aid for Wounds Packet No. 3.
- One Burn Dressing Packet No. 22
- Two 1-yard Red Cross Gauze.
- One ounce Cotton.
- Four Gauze Bandages, assorted.
- Two Cotton Bandages, assorted.
- One Spool Z O Adhesive Plaster.
- One tube Carbolized Petrolatum for burns and scalds.
- One Tourniquet, to stop hemorrhage.
- One pair Scissors. One pair Tweezers. Safety Pins.
- Safety Pins.
- Handbook of First Aid.
- Samples Synol Soap and Toilet and Baby Powder.

INSTRUCTION OUTFIT No. 25

For instructors and lecturers in first aid we have prepared an Instruction Outfit. The articles in this outfit are intended for illustrative and practice purposes. The Instruction Outfit and its uses are quite fully described in this Manual.

FIRST AID STRETCHERS

With the inauguration of safety first and first aid methods among manufacturing plants, mines, railroads, public utility corporations, etc., there has been a demand for an associated article in the form of a stretcher or cot. The stretchers here illustrated are forms which have become standard. They may be obtained from the makers, or from druggists and dealers who carry supplies of first aid appliances. If not obtainable from these sources they may be obtained from the First Aid Department of Johnson & Johnson.



Standard United States Army and Navy Regulation Stretcher. First, the open view; the center illustration is a side view closed, and the third illustration is the bottom view closed.



Allen's Combination Stretcher and Cot. This is particularly constructed for factory use and is covered with brown canvas, tape bound. The illustration shows an open and closed view.

If there is one fact more recognized than another it is this—that the immediate treatment in the case of any injured person has a positive influence and a most important bearing upon the subsequent progress of the case. The interval which elapses between the occurrence of the accident and the arrival of medical aid or the transference of the injured to a hospital is fraught with much moment to the unfortunate sufferer. As in the case of fire, the first five minutes are most important, either in an accident or sudden illness. It is possible that the right thing may be done, but it is just as likely that proper aid may not be applied and serious harm may follow or a valuable life may be lost.

EMERGENCY EQUIPMENT

Many industries, including manufacturing plants, factories, mines, electrical works, railway lines, yards and shops have installed emergency equipments. In some instances such equipments reach towards the proportion of an emergency hospital.

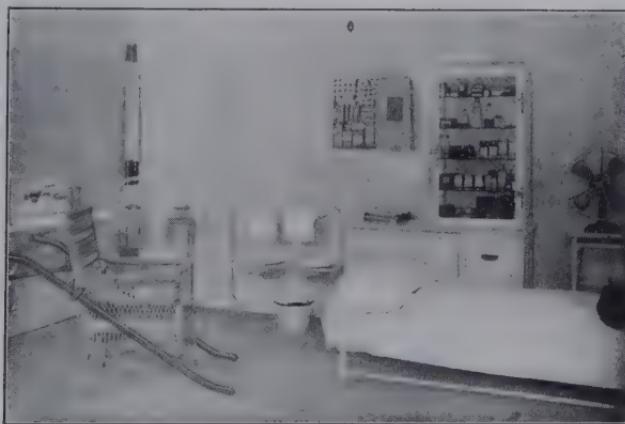
It has been the pleasure of the First Aid Service Bureau of Johnson & Johnson to assist in the installation of many such equipments. The Service does not recommend an elaborate equipment for this work. Usually an unused room, or a room partitioned off for the purpose, is all that is required. The location should be easy of access. Tiling and elaborate furnishings are not required; indeed, are objectionable as suggestive of surgery.

The main requirements are light, air and painted walls.

For a simple but fully efficient outfit the Service recommends a cot, a stretcher, hot and cold water, towels and dressings, and Johnson's First Aid Cabinet No. 1 to form the base of the dressing supply.

In large establishments several Cabinets may be distributed at various points in the works, which Cabinets are to be replenished from the main emergency room.

This method allows first aid to be applied at the spot where the accident may occur, and later treatment to be applied in the emergency room. A room of this character always fills the demand for the care of persons taken ill, or for a rest room, and like uses.



Model Emergency Room for Industrial Establishments

This room is partitioned off in one of the factory buildings. The walls are of brick, lathed and plastered and painted.

Johnson's First Aid Cabinet No. 1 is the main source of supply for dressings. In the upright cabinet is duplicate material in quantity. In the book on the stand the accident reports which accompany the Cabinet are filed.

A room of this character will care for the most extensive injury, and in case the services of a surgeon are required the stock of dressings is always ample.

The entire cost of fitting up this room and its equipment, including carpenter, mason, painting, plumbing, etc., was about one hundred and fifty dollars.

SUNSTROKE AND HEAT PROSTRATION

In sunstroke there is a slow and full pulse, labored breathing, a dry and hot skin, red face and unconsciousness. Remove the patient to a dry and shady place, loosening his collar, necktie, and any tight clothing. Raise the head and upper part of the body. Pour cold water over the head and face, and if very hot rub the body with pieces of ice.

In heat prostration there is a pale face, clammy skin, shallow breathing, weak and rapid pulse, no unconsciousness. Give cold water to drink. Place the patient flat on his back and loosen his clothing. Apply heat to the surface of the body and extremities. Bathe the face with warm water, into which a little alcohol or whisky has been poured.

In prostration from drinking too much ice water when overheated, loosen the patient's clothing, place him on his back with his head slightly elevated. Give hot drinks, apply heat to the spine and the extremities. Don't give alcoholic stimulants. Tea, coffee or warm milk may be used.

In exhaustion from heat due to hard work and confinement in a close, hot atmosphere, cover the body with blankets and apply heat to the extremities. Send for a physician as soon as possible.

FROSTBITE

Carry the patient to a closed room without a fire and undress him carefully.

Rub the frozen parts, or the whole body, with snow or bits of ice, or put the patient in a cold bath, vigorously rubbing the surface affected. Give warm coffee or tea as a stimulant.

If the person has ceased breathing, use methods of artificial respiration (see Drowning). When the patient revives, carry him to a room slightly warmer, and cover loosely with a blanket.

Afterward rub with a cloth wet in warm water, whisky or diluted alcohol. Give beef tea, milk or ordinary tea as stimulants.

FAINTING

Fainting and shock resemble each other closely and are often confused. Shock usually follows severe injuries, is permanent and serious. Fainting is temporary. Shock is seldom accompanied by complete unconsciousness.

Hot water, hot tea or coffee, beef tea or broth are better stimulants than whisky.

Fainting usually requires little treatment, unless the heart is diseased or very weak. Lay the fainting person out flat at once, with the head as low or lower than the body. See that he has plenty of fresh air to breathe. Keep bystanders away.

Remove or loosen heavy wraps, tight collars, corsets and waistbands. Gently dab water upon the face, and hold smelling salts, spirits of camphor or ammonia under the nostrils, without touching them. Do not scald the nose of the patient by holding these applica-



FIG. 81.—Method of carrying a person who is in faint.



FIG. 82.—Bending the head between the knees to prevent fainting.

tions too close or using them too long. Elevate and rub the limbs of the patient toward the body to quicken the circulation. Artificial respiration, or traction upon the tongue, may be required. If the person is slow in reviving, apply gentle heat, or mustard plasters, to the pit of the stomach. After recovery, give a cup of hot tea or coffee, or a teaspoonful of aromatic spirits of ammonia in half a cup of water. Do not let the patient assume an erect position for some time after fainting. Bend the head between the knees to prevent fainting (Fig. 82), but do not resort to this after fainting has taken place.

Never hold strong ammonia (hartshorn) close to the nostrils.

FITS

Treat fits in much the same way as fainting.

If a patient suffers from hysteria, apply mustard plasters to the soles of the feet and to the wrists. Avoid dashing water in the face, or using strong emetics.

An epileptic should be laid upon his back with the head slightly raised. Loosen all tight clothing, remove all objects which might do harm if the limbs came against them. To prevent self-inflicted injury, the patient's arms and legs may be held gently. Thrust a folded towel or piece of soft wood between the teeth to prevent biting of the tongue.

When the convulsion has passed, allow the patient to sleep.

SPRAINS AND STRAINS

Sprains may have serious results. Summon a surgeon at once, but start treatment pending his arrival.

In sprains there is a twisting and tearing of the ligaments at or near a joint, causing a rupture of the small blood vessels and an internal bleeding. The swelling is caused by this bleeding and may be relieved by the application of cold or heat, by pressure or proper placing.

If the sprain is in the ankle or foot, place a folded towel or cloth around the part and cover with a bandage. Apply moist heat. Immerse the foot in a bucket of hot water, adding more water as hot as can be borne, for fifteen or twenty minutes. After this apply a firm bandage and elevate the foot. Repeat bathing treatment frequently.

Instead of hot water, cold applications, or hot and cold alternately, may be used. Apply these by means of cloths dipped in very cold water, wrapped firmly around the part and frequently renewed.

Treat all sprains of joints in the same way.

Support a sprained arm or wrist always in a sling. Use a cushion or pad for a sprained foot or knee.

Use a straight piece of wood properly padded with cotton as a splint. Bandage lightly. Place the arm in a sling.

Give the sprained joint complete rest by using a splint and bandage. After acute symptoms of pain and swelling have subsided, make such applications as the surgeon may direct.

STRAINS.—A strain is the wrenching or tearing of muscle.

Apply a firm bandage or adhesive dressing over the injured part to keep the part at rest. It may be necessary to apply a splint.

Alternate hot and cold applications are usually very effective.

DISLOCATIONS

Send for the doctor at once. Do not attempt to treat a dislocation. Put the part in the position easiest to the sufferer, by using a sling for the upper limbs and a cushion or other support for the lower limbs, as in cases of fracture. If the pain is severe apply either hot or cold wet cloths in the same manner as directed for sprains.

FOREIGN BODIES IN THE EYE, NOSE, EAR AND THROAT

Accidents of this character are complicated and at times very serious. Under any circumstances send for a physician, and in the meantime carry out only such measures as will prevent further damage.

FOREIGN SUBSTANCES IN THE EYE.—Cinders, dust, sand and small objects can often be removed from the eye by simple means. Instruct the sufferer not to rub the eye, and to keep it closed. Tears will often



FIGS. 83 AND 84.—Method of inverting eyelid to find foreign body.

wash such particles into the corners where they can be seen and carefully wiped out with a wisp of absorbent cotton or surgical gauze.

If the body is lodged or hidden from view under the upper or lower lid, catch the upper lid by the lashes and pull it away from the eyeball and down over the lower lid; hold it there for a moment then let the lid recede of itself. The free flow of tears may wash the dust particles into the corner of the eye, or they will be caught by the lower eyelid. Pulling down the lower eyelid will reveal the foreign body if it is lodged there.

Another way is to lift the upper lid and insert a clean piece of blotting paper between the lid and the eyeball. By removing the paper gently the foreign body may be caught and removed. Railroad

Do not touch the eye with dirty fingers or an unclean cloth.

men often carry strands of clean hair with them. (Sterile horse-hair can, by one who is practiced, be doubled and drawn between the eyeball and lid, and the foreign body dragged out.)

If these measures do not succeed, carefully inspect the mucous membrane and cornea. Invert the upper lid. This is done as follows: The patient is told to look down, and while he does so, the edge of the upper lid is pulled first forward and downward by the lashes, then pulled away from the eyeball and upward over the point of the thumb or forefinger of the left hand, which is held on the lid. The lashes are then held against the edge of the orbit. To assist in the examination a magnifying glass may be employed. (Figs. 83 and 84.)

Remove any visible foreign body with a bit of surgical gauze, or an absolutely clean piece of cloth or absorbent cotton, twisted with clean fingers around a match stick or toothpick.

Do not touch the eye with dirty fingers or with unclean cloth or pocket handkerchief.

Never use a knife blade, pencil or needle to remove particles of dust or cinders from the eye, or inflammation may set in and disastrous results follow.

If the fragment is imbedded in the cornea, there is great danger of infection and loss of the eye. Leave its treatment for a physician.

To allay any irritation after a substance is removed, wash the eye repeatedly with warm water containing a little salt (a small teaspoonful to the pint), or with a saturated boracic acid solution, or put into the eye one or two drops of castor oil.

Do not apply eye washes or poultices except under the direction of a physician.

Immediately after treatment cover the eye with surgical gauze, held in place by a roller or triangular bandage, loosely carried around the head. (See Bandaging.)

FOREIGN BODIES IN THE NOSE.—Have the patient blow his nose vigorously while holding the opposite nostril closed. Excite sneezing by tickling the nose or by giving snuff.

In a child such an obstruction may be removed by blowing into the nostril not plugged, or into the mouth.

For lime in the eye, see Burns and Scalds.



FIG. 85.—Blowing the nose to remove foreign body.

If these efforts are not successful summon medical aid, or take the patient to the doctor's office.

FOREIGN BODIES IN THE EAR.—Unskilled efforts to remove foreign bodies in the ear are dangerous to the patient. Never insert wire needles or pins into the ear to aid in removing foreign bodies. The safest rule, especially in the case of a child, is to send the patient to a physician.

If live insects get into the ear, first pour into the ear-canal a little sweet oil or glycerin, then gently syringe it with warm water.

An ingenious method which is sometimes successful is to turn the ear at once toward a strong light and a living insect may come out of itself.

FOREIGN BODIES IN THE THROAT.—Summon a physician promptly. Send him information as to the character of the accident, so that he may bring the needed instruments, as it may be necessary to open the throat to save life.

When there is no serious difficulty in breathing, delay all action until the doctor arrives.

In slight cases a portion of bread swallowed may remove the object.

To help the act of coughing, slap the person on the back while the patient's body is bent forward (face downward), and thus dislodge the bodies in the windpipe.

Facilitate the expulsion, if practical and possible, by lifting the person up by the heels so that the head hangs downward, and then slapping him on the back while in this position.

The patient may be tied to a bench with bandages, and then have his feet elevated by lifting the end of the bench.

If the substance can be seen, open the patient's mouth and press two fingers back into the throat so as to grasp it; even if the effort to grasp it is not successful, the act may produce vomiting, which may expel it.

After the foreign body has been extracted, if the person does not show signs of breathing, use artificial respiration.

INSENSIBILITY—UNCONSCIOUSNESS

People are often found insensible by the roadside, on the street, and in other places; this condition may be due to several causes. It is often very difficult for an inexperienced first aid worker to distinguish between these varieties; cases often arise which perplex the most experienced physician. However, it is safe for the worker to give first aid treatment along general lines as follows:

Send for medical assistance.

Place the patient in a position so as to insure easy breathing. When the patient's face is pale, keep the head low, on a line with the body; when the face is flushed, keep the head up.

When raising the head of an unconscious person, attention must be paid to maintaining a free passage of air through the windpipe; by raising the head, neck and shoulders together, so that the head is not bent sharply either forwards or backwards, the windpipe is kept quite straight.

Loosen all tight clothing.

Provide for a sufficiency of air. Keep the crowd at a distance; if indoors, open the doors and windows so that a free current of air is provided. Fanning will help to produce a circulation of air round the patient's head.

Allow an unconscious person to remain for a time where he lies, protecting him from rain or from the direct rays of the sun by holding an umbrella over him. When signs of consciousness return, he may be placed on a stretcher and carried to shelter. If, however, after a reasonable time (half hour, or more) unconsciousness still continues, removal becomes imperative without waiting for revival.

Examine for wounds, fractures and bleeding, and if necessary care for these.

Give no stimulants or other liquids.

Observe and note the position of the body and whether the clothing is torn or disarranged, also the immediate surroundings.

Observe the state of the pupils, and the character of the breathing.

Report all of the foregoing to the physician or other authorities.

If the person has to be removed, do so with caution. Take him to a hospital rather than to a police station.

ARTIFICIAL RESPIRATION

Resuscitation by the application of artificial respiration is essential in every walk of life. Some of the cases requiring this form of aid may be summarized as follows:

Electrical shock.

Asphyxiation, which arises when the body is deprived of air, as in the presence of illuminating gas, the gases of mines, gas from defective burning of stoves, ammonia fumes, gasoline fumes, gases from a blast furnace, gases from molten metals, vapors from bromine, chlorine, sulphur and formaldehyd, gases and fumes which arise in many chemical processes; exclusion of air, as in a closed vault; confined air, as in a ship's hold, cellars, old wells, etc.

Suffocation, which may follow the inhalation of sewer gas, smoke, etc.

Suspended breathing, which follows inhalation of chloroform, ether, over-doses of laudanum, and certain other drugs; stunning from falls, heavy blows, cave-ins, etc.

In these and other emergencies of like type, the requirements for resuscitation are alike.

The supply of oxygen (air) is cut off in some cases by violence, in some cases by the substitution of noxious gases, and in others by failure to eliminate carbon dioxide produced in the tissue. But in all cases the breathing tissues are inhibited or paralyzed.

First aid treatment is an attempt to restore breathing, to induce air to enter the lungs, to do artificially what is done naturally in health.

This is performing artificial respiration.

There are several well known methods of procedure, each of which has its advocates. The Schaefer, or prone method, has distinct advantages, has been officially endorsed and is rapidly being adopted in this country.

Whatever method is used, the first aid worker should ever have before him the following:

Act promptly. A delay of a moment may mean the loss of a life.

Avoid hurried or irregular motions. All methods depend for success upon the regularity and rhythm of the movements.

Avoid overcrowding, or an overheated room, giving stimulants before the patient can swallow, giving up too soon.

Schaefer Method

This method, also known as the prone method, is most generally favored throughout the United States. It has been endorsed by a Commission representing the American Medical Association, National Electric Light Association and the American Institute of Electrical Engineers, for use in reviving persons overcome by electric shock (see Electrical Accidents).



FIG. 86.—Schaefer (or prone) method of artificial respiration, first movement.



FIG. 87.—Schaefer (or prone) method of artificial respiration, second movement.

The method is the one generally practiced by the United States Bureau of Mines in its mine rescue work.

The Schaefer method is quite generally endorsed by first aid instructors as a standard method. It has the advantage of requiring but little muscular exertion, and for that reason it can be worked by one person alone.

The Schaefer method is carried out as follows:

Lay the patient on his belly, with arms extended as straight forward as possible, and with face to one side, so that the nose and mouth are free for breathing (see Fig. 86). Draw forward the subject's tongue.

Kneel straddling the subject's thighs and facing his head; rest the palms of your hands on the loins (on the muscles of the small of

the back), with thumbs nearly touching each other, and with fingers spread over the lowest ribs (see Fig. 86).

With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the subject (see Fig. 87). This operation, which should take from two to three seconds, must not be violent—internal organs may be injured. The lower part of the chest and also the abdomen are thus compressed, and air is forced out of the lungs.

Now immediately swing backward so as to remove the pressure, but leave your hands in place, thus returning to the position shown in Fig. 86. Through their elasticity, the chest walls spring out and the lungs are thus supplied with fresh air.

After two seconds swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release—a complete respiration in four or five seconds. If a watch or clock is not visible, follow the natural rate of your own deep breathing—swinging forward with each expiration and backward with each inspiration.

The advantages claimed for the prone-pressure method over the Sylvester method are: (1) Greater simplicity and ease of performance, (2) absence of trouble from the tongue falling back and blocking the air passages, (3) little danger of injuring the liver or breaking the ribs if pressure be gradually—not roughly—applied, and (4) larger ventilation of the lungs.

Sylvester Method

Endorsed by the St. John's Ambulance Association. In use by the British Army and Navy, the United States Coast Survey, etc.



FIGS. 88 and 89.—Forcing open mouth and grasping tongue with pliers.

Place the patient on his back on a flat surface, inclined a little upwards from the feet; support the head and shoulders on a cushion, or folded article of dress, placed under the shoulder-blades.

Draw forward the patient's tongue, and keep it projecting beyond the lips. An elastic band over the tongue and under the chin, or a piece of string or tape tied round the tongue, will answer this purpose, or by raising the lower jaw, the teeth may be made to retain the tongue in that position. Remove all tight clothing—especially suspenders, collars, corsets.

Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head and keep them stretched upwards for two seconds. (By this means air is drawn into the lungs.) Then turn down the patient's arms, and press them gently and firmly for two seconds against the sides of the chest. (By this means air is pressed out of the lungs.) (See Figs. 90 and 91.)

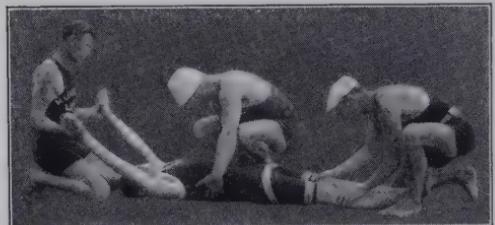


FIG. 90.—Sylvester method of artificial respiration; first movement, with rubbing of the body to start circulation.



FIG. 91.—Sylvester method of artificial respiration: second movement, with rubbing of the body to restore circulation.

Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until an effort to respire is perceived; immediately upon which cease the motions and proceed to induce circulation and warmth.

MARSHALL HALL METHOD OF ARTIFICIAL RESPIRATION.—Sometimes used in conjunction with, or prior to, the Sylvester Method.

Place the patient on the face, raising and supporting the chest well or a folded coat or other article of dress.

Turn the body very gently on the side, and a little beyond, then briskly on the face, back again, repeating these measures cautiously, efficiently and perseveringly about fifteen times in the minute, or once every four or five seconds, occasionally varying the side.

On each occasion that the body is replaced on the face, make uniform but efficient pressure with brisk movement on the back between and below the shoulder-blades or bones on each side, removing the pressure immediately before turning the body on the side.

During the whole of the operations, let one person attend solely to the movements of the head and of the arm placed under it.

LABORDE'S METHOD. This method is useful when the ribs are broken, and none of the previously described methods can be applied. The body is placed on the back with a folded coat underneath the blade-bones, the clothing is loosened, the head held in the middle line, the mouth opened and mopped out, and the tongue seized between the finger and thumb, or by a forceps. Thus held, the tongue is moved backwards and forwards fifteen times to the minute. The air enters when the tongue is pulled forward, the aperture of the larynx and windpipe being opened by this movement.

TREATMENT AFTER NATURAL BREATHING HAS BEEN RESTORED

To Promote Warmth and Circulation.—Commence rubbing the limbs upwards, with firm grasping pressure and energy, using handkerchiefs, flannels, etc. The friction must be continued under the blanket, or over the dry clothing.

Promote the warmth of the body by the application of hot flannels, hot water bottles, heated bricks, etc., to the pit of the stomach, the arms-pits, between the thighs, and to soles of the feet.

If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing has returned, small quantities of aromatic ammonia, coffee or tea may be administered. Patient should be kept in bed, and a disposition to sleep encouraged.

The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance. Restoration has been accomplished after persevering for many hours.

The appearances which generally accompany death are:

Breathing and the heart's action cease entirely; the eyelids are generally half closed; the pupils dilated; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

CAUTIONS

Prevent unnecessary crowding of persons round the body, especially if in an apartment.

Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured.

Under no circumstances hold the body up by the feet.

On no account place the body in a warm bath, unless under medical direction,

RESUSCITATION FROM ELECTRIC SHOCK

Rules recommended by the Commission on Resuscitation from Electric Shock, representing the American Medical Association, the National Electric Light Association and the American Institute of Electrical Engineers, issued by the National Electric Light Association, Engineering Societies Building, New York.

COMMISSION ON RESUSCITATION FROM ELECTRIC SHOCK

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TREATMENT FOR ELECTRIC SHOCK

An accidental electric shock usually does not kill at once, but may only stun the victim and for a while stop his breathing.

Hope of restoring the victim lies in prompt and continued use of artificial respiration.

INSTRUCTIONS FOR RESUSCITATION

Follow these instructions even if the victim appears dead.

I.—Break the circuit immediately.

1. With a single quick motion separate the victim from the live conductor.

Observe the following precautions:

(a) Use a dry coat, a dry rope, a dry stick or board, or any other dry non-conductor to move either the victim or the wire, so as to break the electrical contact. Beware of using metal or any moist material. The victim's loose clothing, if dry, may be used to pull him away; do not touch the soles or heels of his shoes while he remains in contact—the nails are dangerous.

(b) If the body must be touched by your hands, be sure to cover them with rubber gloves, mackintosh, rubber sheeting or dry cloth; or stand on a dry board or on some other dry insulating surface. If possible, use only one hand.

If the victim is conducting the current to ground, and is convulsively clutching the live conductor, it may be easier to shut off the current by lifting him than by leaving him on the ground and trying to break his grasp.

2. Open the nearest switch, if that is the quickest way to break the circuit.

3. If necessary to cut a live wire, use an ax or a hatchet with a dry wooden handle, or properly insulated pliers.

II.—Send for the nearest doctor.

III.—Attend instantly to victim's breathing.

1. As soon as the victim is clear of the live conductor, quickly feel with your finger in his mouth and throat and remove any foreign body (tobacco, false teeth, etc.). Then begin artificial respiration at once. Do not stop to loosen the patient's clothing; every moment of delay is serious.

2. Lay the subject on his belly, with arms extended as straight forward as possible, and with face to one side, so that the nose and mouth are free for breathing. Let an assistant draw forward the subject's tongue.

If possible, avoid laying the subject so that any burned places are pressed upon.

Do not permit bystanders to crowd about and shut off fresh air.

3. Kneel straddling the subject's thighs and facing his head; put the palms of your hands on the loins (on the muscles of the small of the back), with thumbs nearly touching each other, and with fingers spread over the lowest ribs (see Fig. 86).

4. With arms held straight, swing forward slowly so that the weight of your body is gradually brought to bear upon the subject. This operation, which should take from two to three seconds, must not be violent—internal organs may be injured. The lower part of the chest and also the abdomen are thus compressed, and air is forced out of the lungs.

5. Now immediately swing backward so as to remove the pressure, but leave your hands in place, thus returning to the position described in foregoing paragraph. Through their elasticity, the chest walls expand and the lungs are thus supplied with fresh air.

6. After two seconds swing forward again. Thus repeat deliberately twelve to fifteen times a minute the double movement of compression and release—a complete respiration in four or five seconds.

If a watch or a clock is not visible, follow the natural rate of your own deep breathing—swinging forward with each expiration, and backward with each inspiration.

While this is being done, an assistant should loosen any tight clothing about the subject's neck, chest, or waist.

7. Continue artificial respiration (if necessary, two hours or longer) without interruption, until natural breathing is restored, or until a physician arrives. Even after natural breathing begins, carefully watch that it continues. If it stops, start artificial respiration again.

During the period of operation, keep the subject warm by applying a proper covering and by laying beside his body bottles or rubber bags filled with warm (not hot) water. The attention to keeping the subject warm should be given by an assistant or assistants.

8. Do not give any liquids whatever by mouth until the subject is fully conscious.

When breathing is restored the movements can be stopped. Then, and not until then, start the rubbing of the legs and arms toward the heart to restore the circulation.

The efforts to restore breathing should be continued for at least one hour. After the patient becomes conscious give him half a teaspoonful of aromatic spirits of ammonia in a third of a glass of water. Surround him with bottles of hot water, and cover him with a blanket.

Persons shocked by electricity need fresh air.

Electric shocks are often accompanied by various types of burns, which should be treated as ordinary burns.

BURNS OF EYES.—At the General Electric Company works, Schenectady, N. Y., it is the practice to immediately bathe an eye affected by electric flash with witch hazel. In other establishments electrically burnt eyes are dressed with gauze dipped in sweet oil.

ACCIDENTS CAUSED BY ELECTRICITY

Accidents due to electricity are of frequent occurrence. Ordinary trolley and lighting system wires carry high voltage of the powerful current. Contact with them causes most dangerous shock and often death.

In handling electrical apparatus every operative should have before him the caution—safety first.

The avoidance of electrical accidents is fairly easy of accomplishment; the restoration of the injured patient is not easy.

"Rubber gloves should be provided by the employer and used on both hands in the handling of cables and wires, whether the parts are 'live' or not. The workman should satisfy himself before beginning work that the gloves are in good condition. Working on 'live' circuits, especially alternating current, should be avoided as far as is practicable. A man should not work on wire or conductors of any kind with sleeves rolled up or arms exposed, nor should wires ever be handled while standing or sitting in a wet place without extra precaution to obtain insulation from the ground. In handling any circuit over 115 volts known to be 'live,' it is best, if possible, to use only one hand. Keep the other in the pocket or behind the back.

"If the power has been cut off by opening a switch located some distance from where the work is being done, a sign should be always placed on the switch stating that men are working on the line.

"No examinations, repairs, or alterations, necessitating the handling of cables, wires, machines, or other apparatus under high voltage, should be made if it is possible to avoid so doing. In any case such work should be done only by a trained electrician."--Extract from a pamphlet issued by The Fidelity & Casualty Company of New York.

AMMONIA ACCIDENTS

Ammonia gas used in refrigeration plants is at times the origin of serious accidents.

Ammonia causes irritation and congestion of the lungs and bronchial tubes, violent coughing and vomiting and, when breathed in sufficient quantity, suffocation. Liquid anhydrous ammonia produces a condition by freezing which has much the same effect as severe burns caused by acid or scalding water.

In cases of partial or total suffocation by ammonia gas, remove the victim from gaseous atmosphere at once, carry to fresh moving air if possible, and immediately give artificial respiration. (The Schaefer method preferred.) Do not stop to loosen clothing, as every moment of delay is serious. Send for a doctor at once.

After starting artificial respiration, the clothing should be loosened, as well as any other restriction to the breathing.

Do not give the patient any liquid by mouth until fully conscious, after which give mild stimulants and mildly acid drinks (vinegar in water, or lemonade). Keep the body warm and give the patient plenty of fresh air at all times.

If the injury is external in the form of a freezing, or, as it is sometimes called, burning, lint, gauze or cotton dripping wet with carron oil should be applied frequently.

If the ammonia has penetrated through the clothing, the clothing should be removed at once, since it acts as a reservoir, the same as with scalding hot water or steam.

FOR THE EYES.—First, pour a one per cent solution of boracic acid into the eyes, instructing patient to open and close the lids repeatedly, to bring the liquid in contact with the entire inner surface.

Second, after thoroughly washing the eyes, place a small quantity of clean plain vaseline under the lids, by pulling down the lower lid and applying the vaseline with a small match-shaped piece of wood, having smooth rounded ends.

FOR NOSE AND THROAT.—Dip a handkerchief, or a piece of gauze folded once, in vinegar. Wring out lightly and lay over nose and mouth. If liquid ammonia has entered the nose, snuff up some vinegar and apply sweet oil with a feather or cotton to inner surface of nostrils.

If ammonia has been swallowed, administer diluted vinegar, orange or lemon juice in liberal quantities, following up with one to four teaspoonfuls of sweet oil, milk or the whites of three or four eggs with cracked ice. If vomiting is present aid it by liberal draughts of lukewarm water.

ILLUMINATING GAS

Poisoning from the effects of illuminating gas is frequent among workers for gas companies, public service corporations, and of occasional occurrence in orderly households. It requires somewhat different and more extended treatment than ordinary gases.

A pamphlet upon this subject, issued by the United Gas Improvement Company of Philadelphia, divides persons affected by illuminating gas into three classes.

CLASS I.—Those Slightly Affected.

Symptoms—Headache, dizziness, nausea or vomiting, and great drowsiness, with relaxation of the muscles, hurried breathing and rapid heart action.

Treatment—Take patient immediately into fresh air, loosen his collar, open his shirt and walk him around. Give him a dose of effervescing phosphate of soda * in a glass of water, and follow it in five minutes by half a teaspoonful of aromatic spirits of ammonia in

*Effervescing phosphate of soda is given to overcome the nausea, and to act on the patient's bowels. However, if it is not obtainable, plain soda water or Weiss beer will do.

a third of a glass of water. The latter dose may be repeated every fifteen minutes for not more than four doses. Walk patient around until he recovers; then watch him, as he may have a sinking spell.

In walking the patient, two men should support him, and he should have an arm around the neck of each. If the patient is unable to assist in walking, or if at any time he ceases to walk and his feet drag, it is a sign that he has entered the second class of cases. When this happens the walking should be stopped, and the patient should be placed on his back and treated as explained in Class II, below.



FIG. 92.—Applying pressure to the base of the ribs.

CLASS II.—Those Seriously Affected, But Still Breathing.

Symptoms—Semiconsciousness or unconsciousness; patient is very weak and his breathing is rapid and weak. In this class of cases the patient is too weak to walk and unable to swallow.

Treatment—Send for a doctor at once. Carry the patient immediately into fresh air. Place him on his back on a flat surface, with a coat rolled (not folded) under the shoulders and neck, in such a way as to allow the head to fall backward far enough to straighten the windpipe, at the same time open the shirt wide at the neck, loosen the trousers and drawers at waist, and have two assistants rub his legs and arms hard. The sleeves and trouser legs should be rolled up as far as possible so that the rubbing may be done on the bare skin and from the extremities toward the body. Friction thus applied is a stimulus to blood circulation.

If the patient becomes conscious enough to swallow, give him half a teaspoonful of aromatic spirits of ammonia in a third of a glass of water. This dose may be repeated every fifteen minutes for not more than four doses. If the patient is unconscious open his mouth, forcing the jaw if necessary.

NOTE.—If the jaw is rigid, force it open by placing the forefingers back of the bend of the lower jawbone and the thumbs of both hands on the chin, pulling forward with the fingers, and pressing jaw open with thumbs, as shown in Figure No. 88.

Place a block of wood between the teeth to keep the jaws open and to prevent the patient from biting his tongue, using something large enough to prevent any danger of his swallowing it accidentally, and grasp his tongue and pull it forward with tongue pliers, to open the air passageway to the lungs.

Clear froth from the mouth by putting in your forefinger as far as possible and bringing up the froth with a scooping motion. Have the assistant who is holding the tongue saturate a wad of cotton or cloth with aromatic ammonia and slowly pass it under the patient's nose about once a minute as the patient breathes in. See Fig. 89.

Help the patient to breathe by pressing the base of the ribs together every other time he breathes out. Do not press vertically, but press on the patient's sides (palms of hands over lower ribs) in such a manner as to force as much air out of the lungs as possible. You will carry out this pressing action most successfully, if, on beginning, you move your hands in and out with every breath, pressing very lightly until your hands move in unison with the patient's breathing; then begin to press hard with every other outgoing breath.

NOTE.—The object of doing this is to strengthen breathing. By making the pressure every other time he breathes out, you give him an opportunity to take a breath himself. This natural effort to breathe is in itself strengthening to the action of the lungs.

Continue this pressing action until the patient is conscious and breathing well by himself.

The rubbing of the arms and legs, the holding of the tongue and the passing of the ammonia under the nose should be continued as long as the pressing action is necessary. After the patient is conscious, give him half a teaspoonful of aromatic spirits of ammonia in a third of a glass of water; then shift the coat or pillow from under his shoulders to under his head, and surround him with bottles of hot water.

Then cover him with a coat and watch him, as a relapse may follow.

CLASS III.—Those Apparently Dead.

Treatment—Send for a doctor at once, in the meantime acting as

follows: Carry the patient immediately into fresh air. Open his shirt wide at the neck, loosen his trousers and drawers at waist, and roll them up so that an assistant can rub the patient's bare legs. Open his mouth, forcing the jaw if necessary, and insert a jaw block. Grasp the tongue and pull it forward with tongue pliers, having an assistant hold it out. This is necessary on account of the tendency of the tongue to swell in cases of gas poisoning. In the absence of tongue pliers, grasp the tongue between the index and second fingers after they have been covered with a towel or handkerchief. Clear froth from the mouth by putting in your forefinger as far as possible and bringing up the froth with a scooping motion. Then place the patient flat on his stomach, the head turned to one side, so that breathing through both the mouth and nose will not be interfered with, and proceed with artificial respiration using the Schaefer Method.

DROWNING ACCIDENTS

Inasmuch as many lives are lost by drowning, it is suggested that all persons living in localities where such accidents are liable to occur, acquaint themselves with simple and effectual methods of rescue and restoration. A practical way to do this is for two or more persons to go through the movements, one acting as patient, the others as rescuers.

When a person is discovered to be drowning, call to him in a loud voice that he shall be saved, to prevent weakness from fright. Undress as rapidly and completely as possible.

Do not touch the drowning person while violently struggling in the water, but take the first opportunity to seize him, by the hair if possible, and throw him quickly on his back. Swim on your back, towing the body after you, resting his head on your chest. Hold the head with one arm, so that the other arm and legs may be free. This position may be maintained longer, and the body supported more easily, until further aid from shore is received, than by breasting the waters in the usual position.

When the current sets from the land, as in sea bathing, it is better to adopt the position last described, and await aid, than to struggle for shore against the current, for this latter procedure often costs the life of both the rescuer and the one he sought to save, through ineffectual efforts that result in exhaustion.

If a boat is available, the proper places to get bodies into the boat

with the least danger of capsizing are the stern or bow. The patient, in the boat or ashore, should be placed with the head lower than the chest. This may be done by laying the patient on his back on the seat of the boat, or on a hillock of sand, with head extended and dropping backward, and the arms extended behind the head.

This usually results in emptying, by the mouth and nostrils, much of the water that is interfering with respiration. Send for a doctor and begin methods for artificial respiration.

RESTORATION OF BREATHING

Loosen the clothing about the neck and chest, exposing them to the wind, except in very severe weather. Get the water out of the body by tickling the throat with a feather, or apply ammonia to the



FIG. 93.—Resuscitation. Emptying water from air passages. Posed by pupils of Tacoma, Wash., Grammar School Swimming Class, by R. P. Kelly, Supervisor of Physical Training.



FIG. 94.—Resuscitation. Another method of emptying water from air passages. Raise the body on your heels, pressing on small of back for half a minute to start water out.

nose; give a severe slap with the open hand upon the chest and soles of the feet; if no immediate result, proceed as follows:

Place the body, with its weight on the stomach, across any convenient object, such as a keg, box, boat timber, or your knees, the head hanging downward. Open the mouth quickly, and draw the tongue forward with handkerchief or cloth to let the water escape. Keep the mouth clear of liquid.

To relieve the pressure on the stomach roll the body gently from side to side and then back on the stomach. Do this several times to force the water from the stomach and throat.

Open patient's mouth and place some small object between teeth.

With tongue pliers or fingers covered with gauze or cloth grasp his tongue and draw it out. Tie it down to his chin with cloth or

TO SAVE A DROWNING PERSON

A person who is drowning is crazy with fear; he struggles in a frantic way, grasping at everything about him. Unless the rescuer is on his guard his efforts may be futile. The illustrations on this page show methods for avoiding dangerous holds. They were posed by members of the Volunteer Life-saving Association of New York.



FIG. 95.—Back strangle hold. The patient has grabbed rescuer around the neck from the back.



FIG. 96.—Front strangle hold. Patient has grabbed rescuer around the neck from the front.



FIG. 97.—Breaking the front strangle hold.



FIG. 98.—Break of back strangle hold. The arms are forced up and over the head.



FIG. 99.—Head carry. Cover ears with hands, which stops pressure of water in ears, making the patient more comfortable, and he will gradually cease struggling.



FIG. 100.—Under arm carry. Rescuer uses feet for swimming.

rubber band. (Figs. 88-89.) Then begin movements for artificial respiration, using either the Schaefer method (page 72), or the Sylvester method (pages 73-74).

On sign of life, or when breathing is restored, remove the clothing, dry the body and wrap in warm blankets or hot cloths. To encourage circulation, rub the patient's limbs, under the blankets, briskly toward the heart. Brandy or aromatic spirits of ammonia may be given in small doses, slowly and carefully, to avoid strangulation.

RULES IN DROWNING ACCIDENTS

Always pull the patient completely out of the water.

Do not let him cling around your neck or arms to endanger you.

Duck him under the water if necessary until he is unconscious, to loosen a dangerous hold upon you.

Loosen clothing. Clear mouth and secure hold on tongue.

Clear air passages.

Start artificial respiration. Don't hurry breathing movements; take four or five seconds for each.

Apply warmth and friction; when the patient is conscious, give hot water, coffee or hot lemonade.

Don't forget that artificial breathing is of first importance.

Don't give up, keep at work for hours if necessary. Persons have been revived after three hours of steady work.

HOW TO KEEP FROM DROWNING

One finger placed upon a stool, chair, small box or a piece of board will easily keep the head above water, while the feet and other hand may be used as paddles to propel towards the shore. To keep from drowning it is not necessary to know how to swim. In nine cases out of ten, the knowledge of how to sustain the weight is all that is necessary to keep one's head above water.

TO FIND DROWNED PERSONS

Make a board raft, ten or fifteen feet square. Cut a round hole in the center, eight or ten inches in diameter. Lie down on the raft, with the face over the hole, having the head covered with a coat or shawl, to exclude the light. The raft should then be slowly towed over the place where the drowning is supposed to have occurred.

The gases generated by decomposition will usually cause a body to rise to the surface within a week or ten days.

Don't let a drowning person get a hold on you.

TRANSPORTATION OF THE INJURED

Accidents often occur in places where it becomes necessary to carry the injured person to his home or to a hospital. Great care should be taken that the patient does not receive any further injury during the transportation.

Before attempting to move the patient all needed first aid measures should be applied, and the patient carefully prepared for being moved.

Serious cases should be carried on a stretcher, which in emergency may be improvised. In absence of a stretcher various methods of transportation have been devised, some of which are here given.



FIG. 101.—Four-handed seat.

The four-handed seat is made by two persons clasping each other's wrists, as shown in Fig. 101. Each person's left hand grasps his own right wrist, and the right hand of each grasps the other's left wrist.

After the hands are clasped together, the bearers stoop down behind the patient, who sits on their hands, and at the same time he places one arm around the neck of each bearer.

The plan of carrying the patient by the arms and legs with the face downward, commonly called "frog's march," must never be used, as death may ensue from this treatment.

When a proper stretcher cannot be obtained, a temporary one may be made. Turn the sleeves of two coats inside out and button the coats over them. Pass two stout poles through the sleeves. The backs of the coats form the top of the litter.

Take two sacks, make a hole in each corner of the bottoms, and pass two poles through the sacks and out of the holes.

A broad board or shutter may be employed as a stretcher; but if either of them be used, some straw, hay, or clothing should be placed on it, and covered with a piece of stout cloth or sacking. The sacking is useful in taking the patient off the stretcher when he arrives at the bedside.

Always test a stretcher before placing the patient on it. Place an uninjured bystander upon it and spring him up and down.

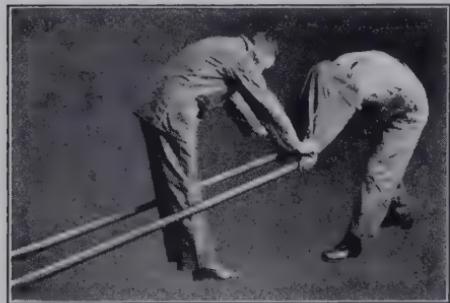


FIG. 102.—Making an improvised stretcher of coats and poles.



FIG. 103.—An improvised "coat stretcher." Three coats have been used.

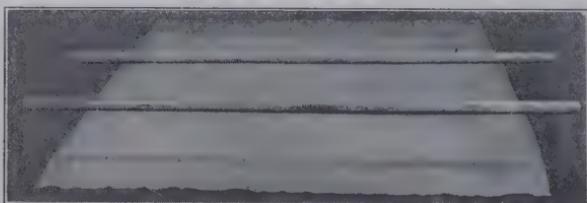


FIG. 104.—Blanket stretcher. Blanket and poles in position



FIG. 105.—Blanket stretcher. Blanket being folded on poles.



FIG. 106.—Blanket stretcher. Completed.

To place the patient on a stretcher, put the stretcher at his head in line with the body. Let the two bearers, on opposite sides of the

patient, grasp hands beneath his back and hips, raise him, lift him backwards over the stretcher and lower him upon it.

Bearers of stretcher must not keep step in marching. Opposite feet must be put forward at the same time to prevent the swaying of the stretcher and the rolling of the patient.

Never allow a stretcher to be carried on the bearers' shoulders.

Always carry the patient feet foremost, except when going up a hill. In cases of fractured thigh or fractured leg, if the patient has to be carried downhill, carry him head first.

In carrying a patient on a stretcher, avoid lifting the stretcher over walls, hedges, or ditches.



FIG. 107.—The blankets are folded or rolled into a cylindrical form, placed side by side and tied together with a reef knot, to make the Blanket Litter.

BLANKET LITTER.—In addition to the methods suggested here for the transportation of injured persons, a blanket litter devised by Surgeon C. E. McDonald commends itself by its simplicity, as it can be improvised under almost any circumstances.

The method requires the service of two bearers and the use of two blankets. The blankets each are folded, rolled or twisted into cylindrical form, as shown in Fig. 107. The two cylinders are placed side by side and their ends are tied together by reef-knots. The bearers then raise the tied blanket rolls, adjusting them with one knot on the right shoulder of the right bearer, and with the other on the left shoulder of the left bearer, as shown in Fig. 108. To transport the patient the bearers kneel, the right bearer on his left knee, the left bearer on his right knee; the cylinder is pulled apart so as to form a sitting space of six or eight inches between the rolls, and the patient, supported by the arms of the bearers, is placed upon this space for transportation. By this method one arm of each bearer is free for any emergency.



FIG. 108.—Carrying in Blanket Litter.

The methods of transportation illustrated in this section need no explanation. They were specially posed under the direction of W. D. Roberts, formerly with the Bureau of Mines, and an experienced first aid instructor and trainer.

STRETCHER DRILL



FIG. 109.—Squad falls in. Count off.



FIG. 110.—Carry stretcher. Forward march.



FIG. 111.—On patient's right. Bearers kneel. Prepare to lift patient.



FIG. 112.—Lift patient. Place stretcher



FIG. 113.—Lower patient.

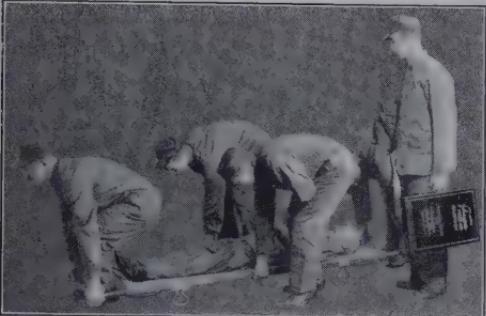


FIG 114.—To carry stretcher. Bearers prepare to lift stretcher.



FIG. 115.—To load ambulance. Bearers load ambulance. March



FIG 116.—Broken Back Splint. Padded splints ready for patient.



FIG. 117.—Broken Back Splint. Patient being raised four inches, so as to allow splint to be placed.

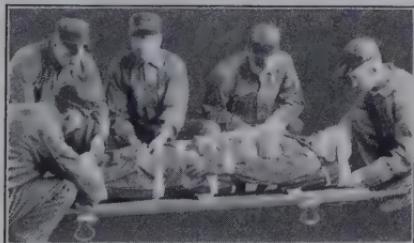


FIG. 118.—Broken Back Splint. Patient tied to the splint and then placed on a stretcher. Note that the hands are held in a loose sling.

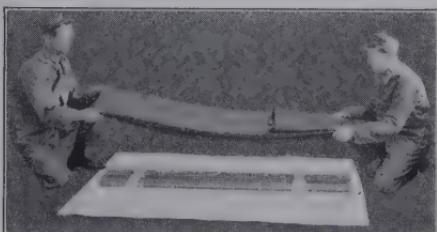


FIG. 119.—The Roberts Broken Back Dressing. A $6\frac{1}{2} \times 5$ foot canvas sheet has been cut along the edge at intervals of three inches, and six-foot splints have been padded with folded blankets.



FIG. 120.—The Roberts Broken Back Dressing. The patient securely fastened in the appliance by tying the ends of the strips.



FIG. 121.—The Roberts Broken Back Dressing. The patient being lifted so as to take him down a ladder.

ONE MAN CARRY ON BACK

FIG. 122.—First method of lifting.



FIG. 123.—Second method of lifting



FIG. 124.—Third method of lifting.



FIG. 125.—Fourth method of lifting.



FIG. 126.—The rescuer ready to lift patient from standing position to his back.



FIG. 127.—Patient on back of rescuer.



FIG. 128.—One Man Carry in Arms. First position.



FIG. 129.—One Man Carry in Arms. Second position.



FIG. 130.—One Man Carry in Arms. Third position.



FIG. 131.—Low Seam Drag. May be used in low seam mines or buildings where the air is filled with smoke and gases. The patient's wrists are tied together with a bandage or handkerchief and rescuer crawls toward the fresh air or exit, dragging the patient.



FIG. 132.—The Morgan Carry. May be used when rescuer reaches place where he can stand erect.



FIGS. 133 and 134.—Bearers take position with knee nearest patient's feet on ground and lift patient first to a sitting position on ground and then to a sitting position on their knees.



THREE MAN CARRY

FIG. 135.—Prepare to lift patient.



FIG. 136.—Lift.



FIG. 137.—Rise.

The three bearers kneel on the knee nearest the patient's feet and slide their hands and forearms under the patient. At the command of "Lift" they lift the patient to their knees. At the command of "Prepare to Rise" the bearers turn the patient so that he is held close to their chests and facing them. At the command "Rise" they rise to their feet.

PREPARATION FOR THE RECEPTION OF THE INJURED

Where an injured or sick person is to be removed to a private house instead of to a hospital, preparations should be made, if possible, before the patient is brought in. In such preparation the following hints will be of value:

A room should be chosen which can easily be reached. The way to the room must be cleared of furniture and loose mats. If the injured person is carried on a stretcher, a couple of strong chairs should be placed ready to support it wherever the bearers might require rest. Unnecessary furniture and hangings should be removed from the room. The bed should be drawn out from the wall so that both sides can be approached, and the clothes turned back on one side to their full length. Several hot water bottles and hot blankets may be required; ...

If the injury is very severe, or if extensive dressings have to be applied, a firm, long table, covered with old sheets or waterproof material, on which to lay the patient, should be placed near the bed.

A firm mattress should be on the bed. If there is much injury, or if dressings have to be applied, a draw-sheet should be placed on the bed, over a piece of waterproof sheeting or oilcloth.

In fracture of the leg or thigh, sprained ankle, and like cases, a "cradle" may be needed. The use of a "cradle" is to support the bedclothes and to keep them from pressing on the limb. Bandboxes, three-legged stools, and similar articles may be used. A corkscrew passed through the bedclothes (with its point guarded by a cork), and tied by a string to the bed or to a nail in the wall, will relieve the pressure of the bedclothes.

In removing clothes from an injured person it is much better to sacrifice the clothes than to run any risk of increasing the injury. In case of a fractured arm, the uninjured arm should be drawn out first. In putting garments on, the injured arm should be put in first.

In burns and scalds no coverings should be dragged off. A sharp pair of scissors should be used, and everything not adhering should be cut away. If anything adheres, it should be left until medical aid can be obtained. Adhering clothing may be soaked with oil. To remove the trousers from a severely injured limb, rip the outside seam.

A fire in the room will generally be of service, even in summer. There should be plenty of water, both hot and cold, also several basins (stoneware or enameled preferred), an abundance of clean towels and soap, slop jars or pails. The basins should be placed on a table, which should be covered with a towel. Towels folded up should be placed on the same table; hot and cold water should be within easy reach.

A new nail brush, scissors, safety pins and needles are essential.

In the case of a burn, absorbent cotton, soft cloths, old linen, oil and bicarbonate of soda (baking soda), should be ready.

In case of bleeding, gauze sponges, plenty of hot water and several basins should be at hand.

If time will allow, the room should be thoroughly cleaned, by scrubbing and dusting woodwork and walls; then well aired.

In placing a bed or cot the head should be toward a partition (inside wall), and the foot, if possible, should be toward the fire.

The bed should be so placed that both sides can be reached easily, so as to allow a free circulation of air without a draught.

POISONS

Poisons are defined as substances which, when taken into the system in quantities larger than the ordinary dose, will produce death or serious disorder.

It is also true that any substance may cause poisoning if misused. For example, cold water if swallowed in large quantities when a person is hot may cause serious or fatal consequences.

The signs and symptoms of poison vary with the nature of the substance and the part of the system acted upon. It is useless to attempt to remember the symptoms or the antidotes for the various poisons. There are, however, certain broad rules which the first aid worker may follow:

Always send for a physician.

It is safe to cause the patient to vomit, by giving an emetic or otherwise, except when the lips, tongue and throat are burned by strong acid or caustic alkali.

Where it is believed portions of the poison are in the stomach, as in the case of poisoning by food or drugs that have been swallowed, make the patient vomit.

To produce vomiting pass the forefinger well back to the root of the tongue and waggle it about; repeat this two or three times. If this measure is not successful add to a tumblerful of lukewarm water a tablespoonful of salt, or a dessertspoonful of mustard, and give it to the patient to drink.

If a physician cannot be had emetics may be procured at the drug store. Common emetics are wine and syrup of ipecac. Of these preparations a teaspoonful may be given to a child and a tablespoonful to an adult. This may be followed with a glass of warm water and the use of the forefinger. Often it is required to use all of the methods in order to produce vomiting as quickly as possible.

When the poison is unknown it is safe to use milk, raw eggs beaten up in water or milk, olive, salad or sweet oil (except in phosphorus poisoning), or strong tea. Where the nature of the poison is known the emetics named may be given as well as milk, eggs, oils or tea.

A physician should be sent for at once whether the nature of the poison is known or unknown.

Foods often become poisoned because they develop within them certain fermentations which act as poisons. The usual symptoms are pain in the stomach, vomiting, weakness, cramps, dilation of the pupils and

drowsiness, which may go on to collapse. In such cases give emetics, castor oil, hot tea or coffee to drink, and apply warmth externally.

Suggested treatment for special poisons:

POISON

Sulphuric Acid	{ No emetic. Give one or two tablespoonfuls of magnesia, chalk, soap suds, raw eggs, milk, sweet oil.
Muriatic Acid	{
Oxalic Acid	If detected immediately give castor oil, sweet oil, raw eggs or milk, followed by an emetic—tablespoonful of Epsom salts or Glauber salts in small tumblerful of milk or water; also mucilaginous drinks. Full strength alcohol applied to external burns from carbolic acid will act as an antidote.
Nitric Acid	{ Give stimulants freely. Give hot and cold douches; emetics.
Carbolic Acid	{ Avoid emetics; wash out stomach; apply warmth to extremities and mustard plasters over heart and calves of legs.
Creosote	{ Give emetics and stimulants. Apply warmth to extremities.
Prussic Acid	{ Give an emetic. Give stimulants. Keep patient aroused. Apply mustard plaster over heart and calves of legs. Use artificial respiration.
Aconite	{ Give emetics—raw eggs, albuminous or mucilaginous drinks. Apply poultices or hot cloths over the abdomen.
Camphor	{ Give strong tea and animal charcoal, and follow this by an emetic. Use artificial respiration when necessary.
Chloral	{ Give emetics such as mustard or ipecac. Give coffee by rectum or mouth. Do not give alcoholic stimulants. Keep the patient aroused by walking, whipping or other means.
Spanish Fly	{ Give vinegar, juice of orange or lemon, citric or tartaric acids. Give also raw eggs, sweet oil, barley water, or arrowroot gruel.
Nux Vomica	{ Give emetics of hot greasy water, or salt and water promptly; a large amount of magnesia, or lime scraped from the walls or ceiling. Give castor oil, sweet oil, or equal parts of sweet oil and lime water, or lime water alone, raw eggs, milk and stimulants (well diluted).
Opium	{ Give copious draughts of warm water and emetics; give white of eggs, milk, oils, flaxseed tea and demulcent drinks.
Caustic Soda	{
Caustic Potash	If detected immediately after swallowing, give an emetic, white of eggs, milk, mucilage, arrowroot gruel, barley water, or flour and water—and give all that the patient will swallow.
Arsenite	{ Give any kind of starch or starch food freely; wheat, flour or arrowroot boiled in water—freely; chalk, magnesia and stimulants. Give emetics and apply external heat.
Blue Vitriol	{
Blue Stone	
Corrosive Sublimate	{
Iodine	

Lead—Red Lead, Sugar of Lead, White Lead, Paints	{ Induce vomiting. Give large doses of Epsom or Glauber salts. Apply mustard plasters to extremities. Give stimulating, sweet or mucilaginous drinks.
Phosphorus	{ Give emetics, followed by magnesia, white of eggs, purgatives. No fats or oils.
Tartar Emetic	{ Give warm water freely. Give stimulants—strong tea or coffee, and apply warmth. Give white of eggs and soothing drinks, such as flaxseed or slippery elm tea.
Zinc Sulphate or Chloride	{ Give bicarbonate of soda (baking powder in water); milk, white of eggs, mucilaginous drinks and emetics.
Belladonna	{ Give emetics and stimulants. Apply warmth to ex- tremities and mustard plasters to the feet. If the patient is insensible, use artificial respiration.
Foxglove	{ Give emetics, followed by repeated draughts of strong tea. Apply mustard plaster over the heart and calves of the legs. Give stimulants internally.
Poisonous Mushrooms (Toadstools)	{ Give emetics, castor oil, stimulants, and apply heat. The same treatment is applicable to poisoning by eating mussels or poisonous fish.

FIRST AID INSTRUCTION

This book is a working Manual rather than a text-book. For this reason, as well as for the sake of conciseness, matters relating to the principles upon which the study and practice of first aid is founded, have been omitted.

Classes in first aid are now numerously organized in factories, mines, Y. M. C. A.'s, boy scout brigades, railway, police and fire departments, and in other institutions and associations.

From these a demand has been made for an outline system of instruction, with a manual as its basis. In response to this demand, and without attempting to give directions to instructors in first aid, the following suggestions are offered.

Classes in first aid may be formed wherever a teacher and one or two pupils can be brought together. Many hundred physicians throughout the country have voluntarily given their time to teaching first aid. Such self-sacrificing work is worthy of note, and should be appreciated.

If the services of a physician cannot be obtained, a trained nurse, a school teacher, a foreman or superintendent, can fit themselves for the task.

Pupils may come from any condition of life, and may be of either sex. They should be persons of temperate habits. Persons who are alert, self-possessed and active are apt to make the best progress.

Above all things, pupils should be selected from among those who enter into the work voluntarily, and who will industriously and conscientiously carry it on.

The lectures or talks may be given at intervals of about one week and should not exceed one hour in length. The pupils should be required to write out notes of the talks. The talks should be interspersed with or followed by demonstration and practice work.

The instructor should in every lesson strongly emphasize one point—the necessity of calling a physician in every emergency case.

Pupils, above all things, should learn when to stop attempts at first aid, and place the patient in the hands of a physician.

In practice work, many instructors have found it convenient to use a boy scout, in tights and sweater, as a model. Instructors sometimes select two bright pupils from a class, and to these delegate the work of making the demonstration which in turn is followed by the class. When the pupils are girls the ordinary gymnasium suit will be found suitable for demonstration work.



First Aid Instruction Outfit.

Teaching and demonstration should be made with actual material. For the systematic teaching as outlined in these lessons we have prepared what is known as the First Aid Instruction Outfit No. 25, here illustrated. Its contents comprise the following:

6 First Aid Packets No. 3	3 Gauze Bandages 2 in. x 10 yds.
6 Triangular Bandages	2 Gauze Bandages, $2\frac{1}{2}$ in. x 10 yds.
2 Wooden Splints	2 Gauze Bandages 3 in. x 10 yds.
1 U. S. A. Tourniquet	1 Gauze Bandage 4 in. x 10 yds.
2 Cotton Bandages 2 in. x 5 yds.	2 doz. Safety Pins
2 Gauze Bandages 1 in. x 10 yds.	1 First Aid Manual

Material used in practice work must not be used for wound dressing afterward, but should be kept apart for practice purposes.

A knowledge of anatomy and physiology is helpful, but not essential for efficient first aid work. There is a tendency on the part of instructors to pay too much attention to the details of anatomy and physiology. At best, these subjects are difficult and uninteresting. It is found that students make much greater progress when their studies are confined to acquiring ability to handle cases of injury and illness which they may encounter.

Experienced teachers have found that the only knowledge of anatomy and physiology necessary is a full comprehension of the arterial and venous

system, the location of the principal organs, and a general outline of the bony structure. This can be imparted by the aid of pictures or diagrams, coupled with demonstrations upon a model. This is about all that any ordinary class can absorb. The danger of infection of wounds is of prime importance, however, for consideration in the bandaging of injuries and the transportation of patients.

Instructors should select subjects with due consideration of the likeliest accidents in the work or the life of the local people. Accidents incident to sports are of particular interest to the younger generation.

The course of instruction may be preceded by a general talk on first aid, its nature, value and necessity in every walk of life. (See First Aid Service for aids in teaching first aid.)

A course of instruction in first aid may be made to cover a period varying from three months to two or more years. There is always something to learn.

In each succeeding lesson a review should be made of the previous topic, and at the close a review of all the topics should be given.

The following course is in outline only. It is based upon Johnson's Standard First Aid Manual.

TOPIC I.

The First Things to Do

(Manual references—pages 9 and 10)

The important points:

- Keep cool. Summon a surgeon. Work quietly.
- Place the patient in a comfortable position.
- Remove clothing and ascertain nature of injury.
- Stop bleeding, if present.
- Dress wound if necessary.
- Transport injured person to a place of safety.

Shock:

- Its importance. Symptoms. Treatment—what to do and what not to do.

DEMONSTRATIONS.—Handling of patient, position, examination for injury, removal of clothing, methods of keeping warm, application of stimulants.

The important point of this lesson so far as it relates to first things to do, should be continuously repeated.

TOPIC II.

Bleeding

(Manual references—pages 11 to 17)

More than one lesson is required to completely cover this subject. It should arouse a discussion on the circulation of the blood.

Distinction between arterial, venous and capillary hemorrhage.

Location of main arteries of the body, with points where arterial circulation may be arrested with pressure. Pupils should locate these positions on their own body.

Dangers of hemorrhage.

NATURAL ARREST OF HEMORRHAGE.—Coagulation of the blood, contraction of blood vessels.

First aid in hemorrhage: Direct pressure on bleeding part. Elevation of part. Application of cold. Pressure on arteries supplying wound.

Internal Hemorrhage.—Spitting of blood, vomiting of blood, nose bleed.

Pupils should practice application of pressure to the arteries by hand, by the use of the tourniquet, and the compress.

They should improvise compresses, tourniquets and pads from objects ordinarily at hand in household or shop.

Caution pupils against touching the wound; against leaving a tourniquet on too long; against the use of stimulants in bleeding.

Call a surgeon. Cover wounds.

TOPIC III.

Wounds

(Manual references—Wounds, pages 18 to 22; bandaging, pages 39 to 52; dressings for wounds, pages 53 to 63.)

This lesson and the three which follow involve the application of dressings and bandaging.

The use of the Roller Bandage and the Triangular Bandage should be made the subject of special lessons or drills. The Triangular Bandage should be given precedence.

Danger of contamination of wounds by unclean hands or dressings.

Contamination averted by covering with gauze, and by thoroughly washing the hands before touching wound.

Use of iodine.

First aid worker expected to apply simplest form of dressing; permanent dressing to be left to the surgeon.

Use of dressing materials in cases and cabinets.

How to treat lacerated wounds, punctured wounds, bruises, poisoned wounds.

Students should be drilled in wound dressing hints and in the use of the surgically clean materials found in the cases.

Instructors should not attempt to go deeply into the subject of wound infection by germs, but should emphasize the necessity of not touching the wounds and of the use of surgically clean dressings.

Drilling in the use of the bandages should accompany this lesson.

TOPIC IV.

Fractures

(Manual references—pages 23 to 29)

This lesson may be preceded by or accompanied with simple instruction as to the bony structure of the human body, joints, etc.

Varieties of fractures, their causes, symptoms and dangers.

First aid is to prevent further damage; treatment is to be left for the surgeon.

First aid workers should never attempt to set a fracture.

Necessity for excessive care in removal of clothing, and handling a fractured part.

Instruction should be given in methods of applying pads and splints to fractures in the various parts of the body, and the use of the Triangular Bandage as a support.

Students should practice the making and using of improvised splints.

Students should be instructed in the handling of compound fractures.

DISLOCATIONS.—First aid consists in fixing the limb in a comfortable position, and awaiting medical aid.

Sprains and strains may be treated with cold applications, bandaging and placing the limb in a comfortable position.

TOPIC V.

Burns and Scalds

(Manual references—pages 30 to 32)

The instructor should emphasize the importance of prompt action in the relief of burns, and the urgency of medical attendance when the injury is extended (second and third degree).

Treatment involves the relief of pain, and the treatment of the shock.

The pupils should practice the handling of a person whose clothes are supposed to be on fire.

They should be impressed with the use of ready-to-hand measures for covering burns and relieving pain.

Burns from acid, chemicals and electricity, as well as sunburn and frost bites, should be exemplified.

TOPIC VI.

Machinery Accidents, Including Factory, Railway, Mines, Shops, Etc.

(Manual references—pages 32 to 38)

The principles embraced in all previous lessons are herein involved. The measures vary according to the kind of work carried on.

Machinery and railway accidents produce mangling, tearing, crushing. Power saws and sharp instruments cause clean cuts—amputations that bleed freely.

Burns are frequent in foundries, rolling mills, chemical works.

In mines, the most frequent injuries are of a crushing nature—from falling rock.

Fractions, simple and compound, are common to all.

Shock, generally severe, occurs with all these injuries.

The necessity for emergency supplies in all factories, workshops, mines, on railways, etc., should be urged in this lesson.

In all accidents of this character, first aid treatment at the time of the accident, and before removal, is of the greatest importance.

The value of first aid instruction to employees should be urged.

The contents of the first aid equipments should be illustrated.

The instructor may well give his principal attention to the special accidents that are most liable to occur in the nature of employment and daily life of the pupils.

TOPIC VII.

Sunstroke, Fainting Fits, Unconsciousness, Suffocation, Foreign Bodies in the Passages, Sprains, Dislocations

(Manual references—pages 64 to 70)

The necessity for coolness, judgment and decision should be urged.

The sending for a physician all important.

The difficulty of distinguishing between the various types of unconsciousness, or insensibility, should be pointed out and a hasty conclusion guarded against.

The first aid worker may always, with safety, send for medical aid, and place the patient in a comfortable and safe position.

Pupils should be cautioned against giving stimulants in these cases.

The complication and danger of foreign bodies in the passages should be pointed out and the necessity of medical aid urged.

This last class of accidents are common in the household, and the pupils may well give special attention to them.

The first aid measures in these cases can best be taught by class practice.

TOPIC VIII. **Artificial Respiration**

(Manual references—pages 71 to 86)

Applicable in drowning, electrical accidents, suffocation by gases and vapors, hanging, smothering, etc.

The class may be drilled in methods of rescue in drowning, gases and smoke, electricity accidents, etc. They should be practiced in both the Schaefer and Sylvester methods of resuscitation.

The instructor in this lesson should be guided by the variety of suffocations which the pupils are most liable to meet.

TOPIC IX. **Transportation of Injured**

(Manual references—pages 87 to 95)

Emphasize the point that the patient should be prepared for transportation at the place of injury.

The ordinary methods of handling and transporting patients with imaginary injuries, fractures, etc., should be learned by practice.

If convenient the use of litters, stretchers and carriers should be exemplified and practice lessons given.

The emergency construction of stretchers from materials found in shops, industries, along railroads, in mines, etc., should be discussed.

Where hospital facilities are not available the preparation of the room where the injury is to be cared for, should be explained.

TOPIC X. **Domestic Emergencies, Including Poisons**

(Manual references—pages 96 to 98 and 104 to 111)

Urge the point that drugs are to be administered only by a physician.

First aid workers should use only simple measures which tend to relieve the patient until the arrival of medical aid.

The class should not attempt to memorize the poisons or antidotes; better rely upon the book.

First aid workers should not administer antidotes when medical aid can be obtained.

Emetics are a safe procedure in each case.

DOMESTIC EMERGENCIES

This Manual is primarily designed to meet accidents which occur in the factory and workshop, and does not, except incidentally, touch upon such emergencies as are liable to occur in the household. There is, however, a legitimate demand for suggestions for use in emergencies which may arise at night, when traveling, camping out or in situations where a physician cannot be summoned. The editor holds firmly to the opinion that drugs should be administered only under the direction of a physician. The suggestions which follow are therefore confined to simple measures which do not require the use of drugs. In all emergencies the first thing to do is to send for a physician.

ANGINA PECTORIS.—Apply cold over the region of the heart. This is more grateful to some people than heat, and should be tried first. Hot applications, such as hot water bags, hot cloths and mustard plasters, may be used where cold applications fail.

ASTHMA.—Persons susceptible to attacks of asthma should keep a supply of suitable burning or inhaling material for immediate use (asthma cigarettes). If such are not at hand, saturate a piece of blotting paper with a strong solution of saltpeter, dry and ignite it; let the patient inhale the fumes. If no other means are at hand, let the person attacked engage in some diversion that will occupy attention, such as smoking a cigar or pipe, reading a book or paper, or writing.

COLIC.—Apply heat in the form of hot water bags, or bottles, hot plates, or mustard plaster over the seat of pain. Hot baths are sometimes useful.

CRAMPS.—Apply mustard plaster to the part affected, and to the extremities. If in muscles of leg or other muscles of the body, bathe the part in water as hot as can be borne. Cramps of the stomach are sometimes dangerous. Apply hot cloths over the stomach or mustard plasters at the pit of the stomach and the extremities.

GROUP.—In sudden attacks divert the patient's attention and allay his fears. Often playing with a toy or listening to a story will cause the symptoms to disappear. Keep the room warm. Boil water in the room in such a way that the steam will reach the sufferer. Flannels wrung out in hot water may be applied to the throat and covered with some waterproof material. Mustard plasters should be applied to the soles of the feet and to the chest for a few moments only.

Hot foot baths to the knees will often bring relief, but if warm applications do not bring relief, try cold. In membranous croup, slake lime in the room under a tent made with a sheet, allowing the patient to inhale the steam. Do not neglect to summon a physician in every case of croup.

DIARRHEA-DYSENTERY.—For a simple diarrhea, such as usually follows a cold or indigestion, a little ginger tea, peppermint or other warm drink will usually bring relief. A tablespoonful of sweet oil for an adult, a teaspoonful for a child will relieve irritation. For dysentery which follows diarrhea, rest in bed, hot compresses, or mustard plasters to abdomen and soles of feet will bring relief.

EARACHE.—Apply cloths wrung out of hot water, to the head, or near the seat of pain. A hop poultice will be found useful. Give hot drinks. Moisten a bit of cotton with sweet oil and put in the ear.

FEVER.—Symptoms of fever often develop suddenly in children, producing alarming symptoms. The best thing to do is to undress the child and put him to bed. Do not cover up too warm; he will be more comfortable with a moderate amount of covering. Give cooling drinks; nothing to eat, except milk. Bathing with moderately cool water will give slight relief.

HERNIA-STRANGULATED.—Place the patient on his back in bed; elevate the foot of the bed about twelve inches; bend the patient's legs back toward the abdomen. Apply to the hernia towels or cloths wrung out in hot water; if these do not bring relief, use cold water.

HICCOUGH.—In severe attacks apply mustard plasters over the stomach. Hot vinegar, brandy or whiskey applied in the same manner will sometimes bring relief. Let the patient draw a deep breath and hold it as long as possible. Let the patient take a drink of water.

HYSTERIA.—Leave the patient alone in a well ventilated darkened room, after seeing that he or she is comfortable and well covered.

NERVOUSNESS.—In severe attacks, put the patient to bed; give hot drinks, especially coffee; apply heat or mustard to soles of feet, back and chest.

NEURALGIA.—Apply a mustard plaster or hot cloths over the seat of pain. If hot applications fail to relieve, apply cold.

SUPPRESSION OF URINE.—Apply hot cloths over bladder; give a warm sitz-bath. In some instances walking over a cold wet floor or dashing cold water on the legs and thighs, will cause a discharge and bring relief.

VOMITING.—Give large amounts of hot water, as hot as can be taken; patient should always lie down. Small bits of ice held in the mouth or swallowed, will relieve vomiting caused by indigestion. A lump of ice held against the pit of the stomach will sometimes bring relief. If other means fail, apply a mustard plaster to the pit of the stomach.

EMERGENCY MEASURES WITH CHILDREN

(1) If a child is suddenly attacked with vomiting, purging, and prostration, send for a doctor at once. In the meantime, put the child in a hot bath for a few minutes, then carefully dry with a warm towel, and wrap in warm blankets. If his hands and feet are cold, bottles filled with hot water and wrapped in flannel should be laid against them.

(2) A mush-poultice, or one made of flaxseed meal, to which one-quarter part of mustard flour has been added, or flannels wrung out of hot vinegar and water, should be placed over the belly.

(3) Five drops of brandy in a teaspoonful of water may be given every ten or fifteen minutes. If the vomiting persists, give brandy, milk and lime-water in the same quantity.

(4) If the diarrhea has just begun, or if it is caused by improper food, a teaspoonful of castor oil, or of the spiced syrup of rhubarb, should be given.

(5) If the child has been fed partly from the breast and partly on other food, the mother's milk alone must now be used. If the child has been

weaned, it should have its milk food diluted with limewater, or should have weak beef tea or chicken broth.

(6) The child should be allowed to drink cold water freely.

(7) The soiled diapers or the discharges should at once be removed from the room, but saved for the physician to examine at his visit.

These rules were authorized by a committee of the Obstetrical Society of Philadelphia.

MISCELLANEOUS SUGGESTIONS

TEMPERATURE OF THE SICK ROOM.—Sixty-eight degrees Fahrenheit is considered a good average temperature for the sick room. In certain diseases, such as fever or brain trouble, it is sometimes allowed to run lower than this; in throat and chest affections it may be higher.

When a patient is being washed or dressed, or a change is made of clothing or sheets, the temperature should be kept at seventy or thereabout. During the night and toward morning the sick or injured person is very susceptible to a change of temperature, and at that time care should be taken of the room and of the covering of the person.

The plumbing and drainage of the sick room should be carefully examined, and if considered a source of danger, the connections with the sewer should be closed by corks.

BATHS.—Cold baths are used to reduce fever, in heat stroke and other cases when the temperature is high. The usual method is to put the patient into a bath of between seventy and eighty degrees Fahrenheit, and to reduce the temperature by adding cool water until it reaches sixty or sixty-five degrees.

Tepid baths are those in which the temperature of the water varies from eighty to ninety degrees. In warm baths, the temperature varies from ninety to a little less than one hundred. These baths are used where there is excitement, irritability, or some affection of the nervous system.

Hot baths are useful in cases of shock, depression and similar ills. The temperature of the water in a hot bath varies from ninety-eight to one hundred and ten degrees Fahrenheit.

Upon leaving the bath the skin should be quickly dried and the patient put to bed as quickly as possible. Hot baths may produce fainting, and should always be taken in the presence of an attendant. Always use a thermometer to take the temperature of the water; the hand is very deceptive.

TEMPERATURE OF THE BODY

In health the normal temperature of the body is 98.4 degrees Fahrenheit. When the temperature is higher than this the patient is commonly said to have fever. The temperature ordinarily rises in the afternoon, being nearly a degree higher then and in the first part of the night than in the early morning. It again gradually falls from midnight to six or seven o'clock in the morning. Should the temperature of a patient taken at ten o'clock at

night be one degree higher than when taken at five o'clock in the afternoon, it need not be considered an increase of fever. The temperature of children frequently rises as much as two degrees from slight causes and this in itself need occasion no alarm.

In severe shock, exposure to cold, alcoholic poisoning, etc., the temperature falls. Should the temperature in such cases fall to 96 degrees Fahrenheit or below, a physician should be summoned at once. Heat should be supplied to the body (see Shock, page 10) and hot tea or coffee given to the patient, at the same time raising the temperature of the room to above 70 degrees Fahrenheit.

The instrument used for recording the temperature of the body is termed a clinical thermometer. The best form is self-registering and has a lens front to magnify the mercury column. The degrees are indelibly marked on the stem, an arrow marking the degree of normal temperature.

TO TAKE THE TEMPERATURE.—First shake the thermometer until the mercury is below the arrow. Then, placing the bulb well back in the mouth beneath the tongue, have the patient close the lips and allow the thermometer to remain in place from two to five minutes. When it is inconvenient to take the temperature by mouth, the thermometer may be placed in the armpit, there to remain for five or six minutes. The temperature of an infant may best be taken by oiling and inserting the bulb end of the thermometer about an inch into the rectum.

THE PULSE.—The average pulse rate in an adult is seventy-six beats per minute. This rate varies according to age, as shown in the following table:

At birth	.....	130-140
1st year	.....	115-130
2d "	.....	100-115
3d "	.....	95-105
7-14 "	.....	80- 90
14-21 "	.....	75- 80
21-60 "	.....	70- 75
Old age	.....	75- 80

In a female the pulse is from ten to fifteen beats quicker than in a male of the same age. The pulse is also quickened by excitement, and after taking food and is retarded by cold, sleep or fatigue.

In disease the pulse is slowed in certain ailments, such as kidney affections, and in certain injuries such as compression of the brain. It is quickened in many fevers, inflammatory affections and in debility.

To count the pulse place the fore, middle and ring fingers over the artery at the wrist; count the beats for fifteen seconds, multiply this by four, and the result is the number of beats per minute.

RESPIRATION.—The number of average respirations per minute of an adult in good health is from sixteen to twenty. In childhood it is higher.

The respiration can be counted by watching the movements of the chest, by listening to the breathing, or by placing the hands upon the chest and counting the number of movements per minute.

BED-SORES.—Bed-sores form on a weak or emaciated person about the hips, on the spine, shoulder blade, or wherever the bones press upon the flesh. Bed-sores caused by neglect are often the cause of death.

They should be treated when the first sign of redness or pain appears. The affected part should be bathed several times a day with alcohol and water. The pressure should be relieved by arranging pillows and placing the body upon them without allowing the affected place to touch anything. Air pillows can be procured for such a purpose. In absence of these, adhesive plaster strips may be applied in such a way as to relieve the pressure.

APPARENT DEATH.—Hold the hand of the person apparently dead before a candle or other light, the fingers stretched, one touching the other, and look through the space between the fingers toward the light. If the person is living, a red color will be seen where the fingers touch each other, due to the still circulating fluid blood as it shows itself between the transparent but yet congested tissues. When life is extinct this phenomenon ceases. Another method is to take a cold piece of polished steel, for instance a razor blade or table knife, and to hold this under the nose and before the mouth; if no moisture condenses upon it, it is safe to say that there is no breathing.

In cases of severe shock it is not sufficient to test the cessation of the heartbeat by feeling the pulse at the wrist. An acute ear can generally detect the movement of the heart by listening with the ear applied to the chest or back. Ordinarily it is very easy to decide between life and death, and the fear of being buried alive is without good foundation.

In cases of apparent death, it is best to disturb the patient as little as possible. Do not unnecessarily alarm friends, and do not give up working while there is the slightest ground for hope. The attendant should notice the exact time at which death takes place. Care should be taken not to announce death prematurely. Shortly after death there may be a high rise of temperature, produced by chemical changes in the blood. This rise of temperature is followed by a peculiar stiffening of the muscles, called *rigor mortis*. Before this latter condition takes place, the body should be prepared for burial. If no undertaker is at hand, the body should be washed with a weak solution of some disinfectant, such as Camphenol or Synol Soap.

If there is any difficulty in keeping the eyes shut, put a small wisp of cotton upon each eyeball under the lid. To keep the mouth closed, put a firm wedge under the jaw in the hollow of the throat. After the jaw is firmly set, the wedge may be removed. Straighten the legs by tying the feet together with a tape. Pack all the orifices of the body with absorbent cotton; bind a cloth around the hips. Over this any clothing desired may be adjusted. Cover the face and all with a sheet. Any slight discolorations may be made less conspicuous by dusting them with toilet powder.

After the removal of the body, the room should be thoroughly cleansed, all the appliances removed, the bedding and clothing sent out to be disinfected, and the room disinfected.

HINTS ON FEEDING AN INVALID.—The kind of food to be given in every case should be decided by the physician; how to prepare and administer the

PURE WATER—Many diseases are water-borne. Look after it.

food is a matter for the attendant. Everything should be the best of its kind, well cooked, seasoned and served. Food should never be prepared in the presence of an invalid, nor should the smell of cooking be allowed to reach him. The attendants should never eat in the sick room. Everything should be served as attractively as possible with clean napkins, spotless china, and shining silver and glass. Avoid spilling anything over the outside of dishes, or upon the tray, etc. Hot things should be served very hot, and cold things very cold. Sick persons require more salt and less sugar than those in health. Bring everything into the sick room covered, either with dishes or napkins. Whatever is not eaten should at once be taken away; it is always better to bring too little than too much. Ascertain from the physician how much it is desirable that the patient should take in twenty-four hours, and divide the quantity up into portions suitable for regular intervals. As a rule the patient should never be aroused from sleep for food. Nourishment the last thing at night will often help to send the patient to sleep.

If the patient is helpless the attendant should assist by giving the food slowly, in small quantities, allowing each morsel to be swallowed before another is given. If there is difficulty in swallowing take advantage of the inspiration. In feeding a patient see that his head is not turned to either side, as this may cause the food to run out at the corner of the mouth instead of down the throat. Fluid food can be given conveniently through a bent glass tube, which is procurable at the drug stores.

In fevers there is often great thirst. If the physician advises, it is safe to allow the patient all the water he may desire. It should be noted that a small glass full of water will be much more satisfactory than the same quantity in a larger vessel. Slightly bitter or acid drinks quench the thirst more fully than water alone. Hot water quenches thirst better than cold. Bits of ice are often refreshing. Small bits of ice swallowed whole or sips of very hot water are excellent to control vomiting.

FORMULAS

CARRON OIL.—For burns and scalds. Mix equal parts of limewater and raw linseed oil; shake thoroughly. This forms a thick, cream-like emulsion that will keep almost indefinitely. Where burning accidents are frequent, this mixture should be kept on hand ready for use. It can be used freely, as no harm will arise from the application of any amount. If linseed oil is not at hand, olive oil or cotton seed oil may be used instead. Linseed oil is, however, the best.

LIMEWATER.—Limewater may be procured ready made at any drug store, and the limewater obtained from reliable druggists is fit for both internal or external use. For external use in an emergency where a drug store is not at hand, take a piece of lime weighing about one-half ounce (about the size of a walnut), slake it by gradually pouring water over it in small portions at a time. When slaked put in a bottle or other vessel and pour on a quart of water (cold); let it stand; pour off as wanted for use. In an emergency it may be used at once without clarifying.

EMERGENCY MEDICINES

It is not the intention of this Manual to encourage self-medication, so names of medicines for internal use in emergencies are omitted. In travelling, camping and exploring expeditions, outfits of simple remedies for use in emergency are sometimes necessary, and in such cases it is recommended that a physician be consulted. It is particularly urged that a collection of drugs, and especially poisons, should not be kept in the household, factory or work shop, unless under lock and key, and in charge of a person skilled in their use.

The following articles are mentioned because they are often called for in emergencies and are more or less known in first aid practice:

AMMONIA.—It should be distinctly impressed upon the mind that there are several preparations of ammonia. All except aromatic spirits of ammonia are energetic preparations, highly irritating and poisonous if taken internally. Applied externally in any considerable strength, they cause blistering and pain. Ammonia in any form should not be applied to open wounds or irritated surfaces, except cautiously in the case of snake bites or stings of insects, where the intention is to neutralize the poisons.

The vapor of the water of ammonia inhaled through the nostrils makes a powerful impression upon the nervous system, and is used in fainting and epilepsy, but it should be applied with caution. A strong preparation of ammonia applied to the nostrils is likely to produce a violent shock. A handkerchief or a wad of absorbent cotton or other material should be sprinkled with the ammonia and held at a safe distance from the nostrils. Contact with the skin will cause irritation. Water of ammonia is sometimes used in a diluted form, as an application for external pains, for mild chilblains and stings of insects. Combined with oils, it forms a very active liniment.

In purchasing ammonia water, the buyer should be cautioned not to procure what is known as concentrated ammonia water.

AROMATIC SPIRITS OF AMMONIA.—This is the only preparation of ammonia intended for internal use. It is a stimulant, and is used in sick headache, hysteria, colic, or fainting, in doses of from ten to thirty drops given in sweetened water.

ARNICA.—The tincture of arnica, sometimes called arnica liniment, is popularly supposed to be of value in accidents, especially those of the nature of sprains and bruises. It may not be generally known that arnica partakes of the nature of a poison, and is especially dangerous if taken internally. For external use strong preparations should not be applied full strength, as inflammation follows in cases of tender skin.

BICARBONATE OF SODA. Also known as baking soda. This preparation should be distinguished from sal soda or washing soda.

Bicarbonate of soda is recommended in the treatment of burns. It is also recommended as an antidote in poison by acids.

CAMPHOR.—Camphor is supplied by druggists in the form of gum camphor, or in liquid form in the shape of spirits or tincture of camphor. Its properties and uses are too well known to need comment. It should be

remembered, however, that in large doses, when taken internally, camphor is a narcotic and irritant poison. It should never be taken in the solid form internally, except under the advice of a physician. Spirits of camphor if given internally should be diluted with some other liquid, or dropped upon sugar. This course will prevent irritation of the mucous membrane of the mouth. The internal dose of the spirits of camphor is from one to twenty drops. Camphor should never be applied full strength directly to open wounds or to irritated or inflamed surfaces.

GINGER.—The essence or tincture of ginger is a popular remedy, and is used in troubles of the digestive organs, bowel complaints, etc. The dose is from ten to forty drops in sweetened water, milk or other liquid.

GLYCERINE.—Glycerine is sometimes recommended for burns. Mixed with equal parts of rosewater it makes a very soothing lotion for chapped hands.

PEPPERMINT.—The essence of peppermint or the tincture of peppermint is a well-known and popular remedy as an anti-spasmodic, a remedy in vomiting, colic and bowel complaints. The usual dose is from ten to twenty drops on sugar or in sweetened water. The oil of peppermint should not be used except under the advice of a physician.

WHISKEY.—Whiskey, brandy, wine and other spirits are by some considered necessary adjuncts to first aid. Their free use is not recommended. Very often they do more harm than good. Hot water, coffee, tea or aromatic spirits of ammonia are to be preferred. (See Shock, page 10.) When it is considered necessary to use alcoholic stimulants, they should be of the very best quality, and should be used in small doses, in hot water, repeated if necessary. Children should never be given spirituous stimulants except in extreme cases, where ten to twenty drops may be given in water.

WITCH-HAZEL.—Known as extract of witch-hazel. This is a popular remedy for sprains, contusions, wounds and swellings. It forms a mild and suitable application for chapping, and is used by the laity for burns, scalds, cuts and abrasions. It has the merit of being non-irritating, and may with propriety be substituted for arnica, or the many highly irritating and dangerous liniments often recommended. It may be applied (full strength or diluted with water) directly to the afflicted spot by the aid of a compress made of gauze or cloths saturated with the extract of witch-hazel.

VASELINE, PETROLATUM, ALBOLENE, COSMOLINE, ETC., are often recommended as applications for burns, scalds or inflammatory conditions. If of good quality, they are useful applications to a variety of injuries, being non-irritating and non-poisonous. They have also the merit of never becoming rancid, and are preferable to ointment or cold cream for emergency uses.

COMMUNICABLE DISEASES

Closely allied to first aid, indeed now considered a legitimate part of a first aid system, is a knowledge of measures to prevent the spread of communicable disease.

Sanitation, hygiene, the prevention of sickness and death are within the realm of the first aid worker.

Communicable diseases—also called contagious or infectious diseases—are spread by means of microscopic bodies called germs, passing from person to person directly, or by means of discharges called secretions or excretions.

These germs are so small that millions of them unperceived may gain entrance to the body through the throat, nose and skin. In vigorous health their presence does no harm, as they do not find a soil suitable to their growth, but in failing health, as in weakness, in a slight cold, inflammation or depressed vitality, a place is found where they can lodge, grow and multiply. Secreted upon or excreted from the diseased body they are carried with infected material from person to person.

They cling to cloths, clothing, bedding, carpets and to the hair and skin of animals. They lodge in the crevices of boards, and in the cracks of furniture. They cling to walls, find their way into food, milk, meats, fruits, decomposing matter, and drains. Damp, moldy places are rich soil for their propagation. They may be carried through the air on the bodies of insects. All persons and all things may become carriers of the seeds of disease.

The most effective means for the control, prevention and ultimate eradication of communicable diseases are: isolation (the separation of the sick from the well); disinfection (destruction of infection), and in the case of smallpox, vaccination.

The following suggestions are intended to be used while awaiting specific instructions from the attending physician, and as supplemental to his instruction. They only include measures tending to prevent the spread of the disease. The treatment of the patient should always be carried out by a physician. These suggestions embrace a condensed résumé of methods endorsed by the best health authorities. They are purposely brief and are adapted to ordinary conditions.

How to Avoid Contagious Disease

Avoid sitting down in the sick room as much as possible. Especially avoid sitting on the bed. Do not even lean against the bed, walls or furniture.

Wash the hands with antiseptic soap after each contact with the patient.

Exercise regularly, if possible in the open air.

Nurses should wear washable dresses, which should be changed frequently. A washable cap should cover the hair.

COMMUNICABLE DISEASES.—Formerly the term "contagious" was applied to certain diseases supposed to be spread by direct or indirect contact, and the term "infectious" was applied to disease supposed to be transferred in an indirect manner. Under our present idea these terms are inaccurate and confusing, the more correct term being communicable (or transmissible), which means that the disease in question may be communicated from one person to another or in some instances from animal to man.

Keep so far from a sick person that his breath will not reach you directly. Above all, do not take his breath into your own lungs, as in kissing or whispering.

Do not put to your lips any food, drink, dish or utensil that the patient has touched, or that has been in the sick room.

Do not go into the sick room with an empty stomach.

Do not eat or drink in the sick room.

Wear no clothing that the patient has worn just before, during or just after his sickness.

Keep the hands free from all discharges from the sick. If the hands are accidentally contaminated, wash them at once with an antiseptic soap.

If the hands are scratched or cut, put court plaster over the wounds. Never touch the sick with sore or scratched hands.

If the patient be sick with any of the eruptive contagious diseases, such as smallpox or scarlet fever, take every precaution not to come in contact with the scales or scabs of the skin.

Kill or drive out of the sick room all flies or other insects. Be sure to destroy all mosquitoes.

THE SICK ROOM

Select a large, airy, light and pleasant room. It should be as quiet as possible.

Before the room is occupied by the patient, it should be made bare of hangings, carpet and upholstery. Unnecessary articles of furniture should be removed. A light iron bedstead, one chair and a table are sufficient.

Clean the walls and woodwork by wiping with a wet cloth before bringing in the patient.

Keep the room always at a temperature of seventy degrees.

Avoid all sweeping. Depend upon scrubbing for cleansing the floor.

Avoid dusting with a brush. Use cloths dampened with a disinfectant solution (one tablespoonful of Camphenol to one quart water) for walls and furniture.

Keep the room always aired and at a temperature as nearly even as possible.

Let in all the direct sunlight possible, unless it seems to hurt the patient's eyes.

Bedding should be changed frequently. Throw the soiled bed clothes into a tub or pail containing a disinfecting solution.

Towels, napkins, or bandages should always be clean. They should be taken from the room and disinfected after each time of using.

All dishes, cups, glasses, spoons, and utensils which have been in the sick room should be disinfected before being taken out. Scalding hot water and soap are effective for this purpose.

Toys, shears, vases, combs, brushes or anything that has come near the patient should be disinfected or destroyed.

It is a good rule in communicable diseases to consider that everything that has been carried into the sick room has become infected and needs disinfecting before being used elsewhere.

Dishes used by the patient should not be used by others, or washed with other dishes.

The food should be brought into the room just before the patient is ready for it. All articles of food left should be burned, or else mixed with a disinfectant and buried. Do not allow milk or other food to stand in the sick room. Whatever drink or food has been in the room, must not be used by others, or fed to dogs or cats.

The bodily discharges from the sick should all be considered dangerous. In typhoid fever, the bodily excreta is the ordinary means of infection. The eruptions of some diseases, though ordinarily supposed to appear only on the surface of the skin, are equally common inside the body, throughout the whole alimentary canal. Therefore in all the dangerous diseases care must be taken to avoid infection from the discharges. Discharges must be considered to include sputum as well, for the sputum is the source of infection in consumption, diphtheria, and other maladies.

Excreta from the bowels or kidneys should immediately be covered with a disinfectant solution. The vessel containing the discharges and disinfectants should be shaken and after half an hour the contents thrown into the watercloset, or if there be no closet with sewer connection, buried in the ground. The discharges should never be thrown where they might contaminate a running stream. Vessels used to catch discharges should be thoroughly disinfected with boiling water and a disinfectant.

CHICKEN-POX

This is a mild but highly contagious eruptive disease. An eruption is often the first and only symptom. Generally a few isolated pimples are noticed on the face. The disease may be conveyed as long as the scabs are present. At times when chicken-pox is prevalent all cases of pimples should be reported to a physician. Children affected with chicken-pox should be kept at home, but quarantine is not necessary. Children should not be sent to school or allowed to mingle with other children for at least two weeks after the recovery of the last one affected in the home.

CONSUMPTION

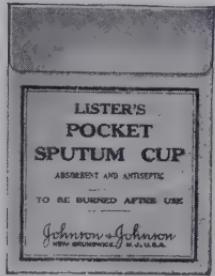
Consumption, otherwise known as phthisis or tuberculosis, is a germ disease and is conveyed from one person to another by means of the spittle. Consumption of the lungs is very insidious, and if neglected it usually proves fatal.

The first indications often suggest a lowering of vitality, rather than any specific disease. There may be poor appetite, gradual loss of weight, lassitude or weakness and indisposition to exertion, sensitiveness to cold, palpitation of the heart, slight fever, especially in the afternoon or evening, indigestion, neuralgic pains, slight cough or clearing of the throat in the morning, and lingering colds. It is very important that one who experiences the slight symptoms which are the first warning of consumption should at once place himself under the care of a competent physician without trying to treat himself, or waiting for more alarming symptoms to appear.

The consumptive should not expect to be cured by medicine, but by persistent effort on his part, and by faithfully following the directions of his physician.

Since the sputum is by far the most important, if not the sole means by which the germs are cast off from the consumptive's body, there is practically no danger from consumptives who take proper care of the sputum instead of expectorating promiscuously, and such care is to be insisted upon and encouraged by every possible means.

There is nothing more necessary for a consumptive than the constant use of a sputum cup. He should spit nowhere except into an antiseptic sputum cup. Various patterns of these cups are made, among which are those here illustrated and described.



The Lister Pocket Sputum Cup. An envelope of waterproof pressed paper.



Johnson's Sputum Cup and Holder. A metal holder and paper cups. Intended for home use.

The following simple rules should be enforced in every case of consumption:

Never cough without a handkerchief before your mouth; it endangers others. Never cough in a dining room. Never swallow your expectoration, or cough while lying on your back. Thoroughly cleanse the mouth before eating. All sputum must be destroyed. Do not expectorate on the ground, supposing that the sun's rays will thoroughly disinfect the sputum. Such a belief is erroneous and pernicious. All persons who cough should refrain from kissing. The consumptive who conscientiously carries out these simple precautions is in no wise a menace to those about him.

The consumptive's room and his clothing should be disinfected occasionally. In case of the removal of a consumptive from one house to another, or upon his death, the house (especially the apartment used by the consumptive) should be thoroughly disinfected before being occupied by others.

Consumptives are warned against the many widely advertised cures, specifics and special methods of treatment of consumption. No cure can be expected from any kind of treatment except the regularly accepted method known to every reputable physician. This treatment depends for its success upon pure air, outdoor life and nourishing food.

CROUP

Sometimes a membrane begins in the wind pipe, mechanically producing the obstruction to breathing, and the peculiar cough which we call "croup." This happens so often and is so frequently assumed to be some other affection than diphtheria (thereby opening the way for the unchecked virus to do its deadly work) that experience has taught us to treat all cases of croup as diphtheria.

COLDS

Colds are contagious; they are caused by germs.

The germs are spread through the discharges from the mouth and throat of one person to another.

Draughts, wet feet, sudden changes of the temperature do not cause colds. These conditions, however, weaken the body and favor the growth of germs and the development of the cold.

Colds are the beginning of influenza, grippe and croup.

Colds are a forerunner of diphtheria, the precursor of croup.

Colds often usher in measles, and mark the beginning of whooping cough.

Colds are at times a sign of rheumatism, and one of the signs of adenoids.

Colds often lead to consumption.

Preventive Rules for Colds.—Do not get close to others who have colds.

Do not use handkerchiefs, towels or cups that have been used by people who have colds.

Do not sneeze or cough except into your own handkerchief.

Do not spit on the floor, and thus spread colds, tuberculosis and other diseases.

Do not neglect a cold. During the first few days if you have fever stay in bed. This will help you and protect others from getting your cold. Take a laxative and use simple household remedies. If these do not help you, call a doctor.

Keep your body in good condition and you will be able to resist the germs causing colds.

Colds come from the bacteria in your mouth, teeth, nose and throat. Keep these parts clean by the use of reliable antiseptics.

DIPHTHERIA

Diphtheria is principally a children's disease, although grown persons are by no means safe from its ravages.

On the slightest suspicion of sore throat, especially among children, a physician should be summoned. If the sore throat be accompanied by bad breath and fever, the child should immediately be separated from all other persons, except necessary attendants, until it be ascertained whether or not diphtheria is actually present.

Every person known to be sick with diphtheria should be promptly and completely isolated from the public. Only such attendants as are actually

The use of what is known as diphtheria antitoxin, as an antidote to diphtheria, has been the means of saving thousands of lives. In cases of suspected diphtheria the physician and health authorities should be consulted at once in reference to its use.

necessary should have charge of or visit the patient, and these should be restricted in their intercourse with other persons.

Since the special contagion of diphtheria is in the mouth and throat, the greatest care must be taken of the sputum. It is best to receive it in a spit-cup or spittoon containing a disinfectant, or upon cloths to be burned. Clothing, towels, bed linen, or any clothes that have come in contact with the patient should, before removal from the sick room, be placed in a pail or tub of water containing a disinfectant.

Nurses and attendants should have at hand a disinfectant for washing the hands and face when about to leave the sick room, or for washing the hands after each contact with the patient.

The period of recovery in diphtheria is dangerous. All persons thus convalescent should not be permitted to associate with others or to attend school, church, or any public assembly until the throat and any sores upon lips or nose are healed, and until in the judgment of the physician and health authorities all danger is over.

At the time of an epidemic of diphtheria, rooms which have been occupied by a patient should be thoroughly disinfected. School children should be carefully watched and any case of sore throat or other suspicious symptoms reported. School children should be cautioned against the use of common drinking cups, the exchange of pencils, books and chewing gum. Permit no child in whose family diphtheria exists to attend school.

Rules for Avoiding Diphtheria

Even the mildest case of diphtheria is dangerous.

Do not let a child go near a case of diphtheria.

Do not allow a dog, cat, or other animal to enter the sick room.

Allow no person to visit the sick room.

Food into which the diphtheria contagion has gained entrance should be carefully avoided.

Avoid any exposure to the throat at times when diphtheria prevails.

Wear or handle no clothing from a sick room.

Use no dish used by the sick. Allow no child to use any dishes or toys that have been in the sick room.

In epidemics regard all persons having sore throat as probable diphtheria patients. Never kiss such persons, and observe all care about allowing children to touch their clothes or dishes. Keep your children away from them as much as possible.

After a death or recovery from diphtheria, the room in which there has been a case should, with all its contents, be thoroughly disinfected. As the dead body of a diphtheria patient is extremely dangerous, the interment should be as soon as possible. Public funerals in case of diphtheria should not be permitted.

MEASLES

Measles is one of the milder eruptive fevers, usually recognized by its peculiar catarrhal symptoms and the characteristic rash. The specific infection of measles is produced in the rash, which often invades the membranes of the nose, throat, lungs and bowels more severely than the skin.

Measles is distinctly a children's disease, rarely affecting adults. It is scarcely ever caught more than once, and for this reason the custom of exposing a child to it and "getting through with it" was common. To children between the ages of two and five, neither diphtheria nor scarlet fever is so dangerous as measles.

As measles is a very infectious disease and as the germ or germs are easily transmitted, the separation of the sick from the well is necessary and should be strict. Communication between persons sick with measles and the well, and the moving of articles from the infected room or premises, should not be allowed.

The patient should be kept from school until recovery and the disinfection of the person and premises.

Other children of the same household, except those who have had the disease, and other children exposed to the disease, except those who have had the measles, should be excluded until the twenty-second day after the child last saw the patient.

Children exposed in school are likewise excluded.

The prevention of the spread of measles depends for success upon two things—keeping the sick from contact with the well (isolation), and cleanliness in a superlative degree in respect to the things handled by the sick.

The disease is contagious for some time before it is recognized. Therefore parents should learn to treat all "colds" in children as suspicious, and to guard against contact with other children until the nature of the cold is ascertained.

GERMAN MEASLES.—Of this disease but little is known. It is the general opinion that it is less contagious than the ordinary measles or scarlet fever, with either of which it may be confounded. The first and generally the only symptoms are some catarrh and slight fever. Quarantine is not necessary. It is wise, however, to keep children in whose family there are cases of German measles from school for a week or ten days, as many cases supposed to be German measles are really cases of scarlet fever. A physician should be consulted when the first symptoms appear.

CEREBROSPINAL FEVER

This disease is variously called also by the names spinal meningitis, cerebral meningitis, acute meningitis, infectious meningitis, cerebrospinal meningitis, tubercular meningitis, spinal fever and spotted fever.

Children and young adults are the most susceptible. Meningitis is a communicable disease. It is believed that meningitis is spread through the discharges from the nose and throat.

There is obtainable a curative vaccine—anti-meningitis serum.

Isolation and disinfection are means which should be employed to prevent the spread of the disease. Particular attention shou'd be given to discharges from the throat and nose.

In times of epidemics every case of cold should receive attention, and young persons should be kept from crowded places. Personal cleanliness, especially of the mouth, throat and nose, should have more than usual care.

INFANTILE PARALYSIS

This is primarily a disease of childhood but no age is immune. In recent years epidemics have occurred with increasing frequency. While little is known as to the methods by which this disease is transmitted, it has been established that the virus or the germ of the disease is present in the discharges from the nose, throat, and bowels of those ill with infantile paralysis, even in those who do not go into paralysis.

It is believed that the virus may enter the system of the victim in the same way. It has been claimed that the virus may be transmitted by the bite of certain species of flies. It has been suggested that the disease may be conveyed by dust, by food infection, and by inoculation through wounds.

Experienced physicians are at times puzzled in making an accurate diagnosis of infantile paralysis, hence it would be quite futile for a layman to make an attempt.

At times when the disease is prevalent in a community symptoms which should be regarded as suspicious are fever, vomiting, diarrhea, listlessness, unusual fretfulness and drowsiness. When one or more of these symptoms appear a physician should be called at once.

Knowing that the secretions are one means by which the disease is spread, measures for preventing the spread of infantile paralysis will in general coincide with those for preventing the spread of scarlet fever and diphtheria, with certain precautions necessary in typhoid fever.

Suitable measures therefore are embraced in the effectual isolation of the patient for a period of from six to eight weeks.

Children who have been exposed to the disease should be isolated for a period of at least two weeks, and adults should be kept under observation for a like length of time.

The sick room should be effectually screened and household pets should be excluded.

So far as is known the essence of the prevention of the spread of the disease is to maintain so far as possible conditions of cleanliness, which include more than ordinary bathing. The frequent washing of the hands with an antiseptic soap (such as Synol) is advisable. Personal cleanliness involving the use of disinfectants should be maintained in the room in which the patient is confined.

The cloths used to receive the discharges from the mouth and nose of the patient should be burned.

The discharges from the bowels should be disinfected by the use of a disinfectant such as Camphenol or an equivalent substitute.

Dishes and utensils used in the sick room should be disinfected (with Camphenol or Synol) before being removed from the room.

It is perhaps unnecessary to urge that in times when this disease is epidemic the assembling of children either at play or in other gatherings should be discontinued. In some instances it is necessary to close the schools.

Children in families where there is infantile paralysis should not be allowed to leave their homes.

MUMPS

Children between the ages of four and fourteen are most susceptible. The disease is contagious from the beginning of the symptoms and for several days after the swelling has disappeared. It is conveyed by contact or through the spittle. The characteristic symptoms are swelling of the face just in front of or below the angle of the jaw. Chewing becomes painful and at times there is headache, vomiting, and general depression. The patient should be quarantined for three weeks and no children should be allowed to return to school or to mingle with other children for at least twenty days after the last case of the disease in the household. The complications of this disease are more dangerous than the disease itself.

PINK EYE

This disease is conveyed by the discharges from the affected eye. The first symptoms are red lids and water running from the eye. There is pain, headache and sensitiveness to the light. There is a great tendency to transmission in the use of a common hand towel, or in the lending of a handkerchief. Children afflicted with pink eye should not be allowed to mingle with other children or be sent to school. All articles used by the patient should be carefully disinfected, boiling water being sufficient in this case. All cases of inflammation of the eye should be at once reported to a physician.

RINGWORM

This disease is easily communicated. It flourishes particularly among those who are dirty and neglected, but it may attack children who receive the best of care. Ringworm is recognized by its peculiar seabby sore or patch. It may occur upon the face or other parts of the body, but most frequently it attacks the scalp where it produces bald areas on which are stubby growths of broken and diseased hair. It is often very persistent and may resist treatment for many months. A physician should be consulted immediately upon the appearance of a case of ringworm. Under proper treatment a child need not be excluded from school. Care should be taken to avoid the exchange of wearing apparel, particularly hats, and to prevent close contact with the person afflicted.

Persons having ringworm should use separate towels, soap and other toilet utensils. Toilet articles used by them should be boiled after each use.

SCABIES

This disease is transferred by close contact. It is accompanied by roughness and cracking of the skin, itching and frequently bleeding of the parts affected. The skin at the base of, and between, the fingers is especially liable to be affected. Children with itch should not attend school, or mingle with other children, unless they are being treated by a physician. At times when this disease is prevalent the children should be instructed as to the nature of the disease, and cautioned against wearing the clothes of others, such as hats, gloves, or baseball mitts. They should not be allowed to take hold of hands in ring games, or to use books in common with others. Persons afflicted with itch should use separate towels, soap and other toilet articles.

SCARLET FEVER

(Scarlet Rash, Scarlatina and Canker-Rash)

Scarlet fever is a disease which is easily communicated from the sick to the well.

The contagion may be conveyed by any of the discharges from the body of the sick person, by infected clothing, hair, food, or books, or indeed by almost anything touched by the sick while the scaling or peeling of the skin is going on.

The usual symptoms are rapid rise of temperature, soreness of the throat and tonsils, and, occasionally, spots or membrane patches in the throat. Vomiting is one of the early symptoms.

Immediately isolate every case of scarlet fever, however mild. Malignant and fatal forms of the disease often arise from exposure to a case of the mildest type. The greatest care must be exercised to prevent the spread of the disease from the sick room.

Disinfection and isolation of the sick are the necessary preventives of the spread of this disease.

The period of recovery is especially dangerous, for it is at this time that the patient is losing the scurf skin which has developed in the course of the disease. Persons should be considered dangerous for at least two weeks after recovery, and should not be permitted to attend church, school, or public assembly, or to use any public conveyance.

Children who have been exposed to scarlet fever should be kept in strict isolation for at least seven days. Children should not be allowed to attend school from an infected house, unless under direction of a competent health authority.

Frequent baths are of use to hasten the peeling of the skin.

After the recovery or death of the patient, cleanse the sick room by thorough disinfection.

In case of death wrap the body in a sheet soaked with a disinfecting fluid. The funeral should be private.

TYPHOID FEVER

Typhoid, or enteric, fever is a most severe disease of the intestines to which persons of all ages are liable.

The greatest number of deaths from typhoid fever occur in persons in the prime of life. A person having this disease in a mild form may impart it in a fatal form to another.

The germ, or seed, of typhoid fever enters the body through the mouth and attacks the walls of the small intestines. The poison produced by the germ in the course of its growth gives rise to the typhoid inflammation.

The discharges from the sick, such as the stools, urine and sputum, carry the infective agent. These discharges easily reach and contaminate food, water and milk, and in this way the disease is spread from the sick to the well.

Uncooked green vegetables, contaminated with infected water or soil, uncooked oysters and shell fish from polluted water have been known to be a source of the disease.

Flies and other insects feed and breed upon the infected discharges of typhoid patients and carry infection to the food supply of the well.

Persons living in the same house, or who visit a typhoid patient, may carry away the germs of typhoid on their hands or clothing, and by these and other means the infection may be transmitted.

The symptoms of typhoid fever are at times very obscure. Some of the symptoms are described as vomiting, depression and the slow onset of fever.

In times when typhoid fever is present in a community, or at any time when symptoms of this character are present, a competent physician should be called at once. The symptoms may manifest themselves in from one to four weeks after exposure to the infection.

At times persons may carry typhoid fever ("walking" cases, "carriers") without being troubled with any of the severer manifestations of the disease, but such mild cases may transfer the disease in its most virulent form.

Typhoid fever is communicable from the sick to the well from the beginning of the disease for an indefinite period.

Sedgwick, an eminent authority, has stated that in the prevention of typhoid fever the problem is "to keep the excreta of A (the patient) out of the mouth of B (the well)."

The measures which will tend to prevent the spread of this disease are as follows:

The reporting of the location of the disease to the health authorities.

The early diagnosis of the disease, for which means what is known as bacteriological diagnosis may be carried out through a local or state laboratory.

The sick should be separated from the well. If proper isolation cannot be secured the patient should be taken to a hospital.

The discharges from the sick should be carefully disinfected.

Isolation should not be terminated until the patient's discharges are free from germs, which can be determined only by cultural examination.

The prevention of the pollution and infection of water and food supplies, especially milk, is an important part in the control of typhoid fever.

Protective inoculation against typhoid fever has been employed, and anti-typhoid fever serum has been used to a limited extent in communities to prevent the spread of epidemics.

At times when typhoid fever is prevalent in a community or neighborhood, or when present in the household, the following measures should be observed:

For drinking purposes use only water known to be pure, or water which has been boiled.

All milk, the source of which is not absolutely free from suspicion, should be brought to the boiling point.

Raw shell fish, such as oysters, should not be eaten. Cooking destroys the germs.

Avoid green fruit and other things liable to set up indigestion and diarrhea.

Avoid bathing at beaches or in rivers or lakes near the opening of a sewer.

See that windows and doors are protected by fly screens, especially those of kitchen and dining room.

Every case of diarrhea is to be suspected, and should be treated as a case of typhoid. All decaying animal and vegetable matter around any premises should be removed, and both it and the drains, vaults, and damp places thoroughly disinfected.

Disinfect all manure piles and privy vaults in order to destroy flies.

Do not visit the sick room unless it is absolutely necessary.

Do not eat or drink anything that has been in any way connected with a typhoid patient.

DYSENTERIC DISEASES

Dysentery and diarrhea are now considered communicable or transferable in the same way as typhoid fever. Certain of these diseases may become epidemic and may be spread through a community as is the case with typhoid.

Some forms of dysentery are known to be caused by germs, others are of unknown or obscure origin.

All forms of dysentery should be cared for in the same manner as outlined for typhoid fever.

Cases should be placed in the care of a physician at once, the patient isolated, and discharges disinfected.

Flies should be guarded against. General measures of thorough cleanliness and disinfection should be established.

SMALLPOX

This disease is also known as varioloid, or variola, and sometimes erroneously called Cuban itch and Puerto Rican chicken-pox.

Smallpox is one of the most highly contagious and dangerous of diseases. The contagion of smallpox may be carried from one person to another by actual contact, or it may be carried from place to place by means of infected clothing, bedding, merchandise, letters, or any other infected article.

Smallpox is a preventable disease. Upon the first appearance of a case in any locality, systematic vaccination should be resorted to. In times of epidemic, revaccination should follow in all cases where the operation has not been successfully performed within the preceding twelve months. Vaccination should in all cases be performed by a qualified physician. Smallpox in any form requires strict methods of quarantine and disinfection. Every case of suspected smallpox should be reported at once to the local board of health.

WHOOPING COUGH

Whooping cough is primarily a children's disease, cases in persons above ten years of age being rare.

The germ of whooping cough finds a lodgment in the throat and is scattered through the air by the coughing of the sufferer. This disease is easily conveyed from one child to another.

Whooping cough usually passes through three stages. The first stage lasts about ten days and can hardly be distinguished from an ordinary cold. The spasmodic stage lasts about one month and is accompanied by the characteristic whoop. The last stage often lingers for months, especially during

the winter. The unmistakable symptom is the spasmodic cough followed by the crowing sound, usually accompanied by the expulsion of a thick mucus and sometimes by vomiting, and bleeding at the nose. Whooping cough patients should be quarantined for about six weeks, or until the end of the spasmodic coughing. Children should not be allowed to attend school if there is a case of whooping cough in the family.

A child with whooping cough should be kept separate from all other children. The sputum should be received in sputum cups or vessels containing a disinfectant, or on cloths or paper handkerchiefs that can be burned. After recovery the patient's clothing should be disinfected. The body should be bathed with an antiseptic soap.

COMMUNICABLE DISEASES OF ANIMALS

Many diseases of animals are more or less communicable to man as well as to other animals. Among these are the following: glanders, lumpy jaw, nasal gleet, farcy, scab in sheep, hog cholera, swine plague, epizootic.

When any of these diseases are present or suspected, all harness, bits, blankets and covers should be disinfected by washing with hot water and a disinfectant such as Camphenol. Straw and anything else used in bedding should be burned. The walls of the stable should be washed with a strong solution of a disinfectant and hot water. This should be repeated until recovery or death of the animal.

Afterwards go over the stable washing thoroughly with the disinfectant, burning up all rubbish until the barn is safe.

All well animals should be kept in a clean, fresh place.

INSECTS AS CARRIERS OF DISEASE

It has been established that many diseases, including malarial fever, yellow fever, typhoid fever, scarlet fever and smallpox are carried by insects, such as mosquitoes and flies. Insects act as carriers or go-betweens, sucking the blood of a sick person, and in due course carrying it to a well person, to whom they convey the infection. Often they convey disease when they have not sucked diseased blood but have received infection from polluted blood, water, sputum or excreta of some sort.

It has been found that measures directed against certain insects have been the means of stamping out or at least of assisting to eradicate infection. In every infectious disease, it would therefore seem a wise precaution to kill all mosquitoes and other insects around the sick room; to prevent insects from biting both the persons who are sick, and those who are well; to prevent insects from having access to the sick room or from coming in contact with food intended for persons who are well.

Doors and windows should be screened in neighborhoods where contagious diseases may be carried by insects.

It is known that mosquitoes breed in pools of water and in damp places. All pools should be drained or filled; all cans, barrels, or other receptacles for the collection of water should be cleaned out. In case filling or draining is not possible, the places should be freely sprinkled with a disinfectant or kerosene oil.

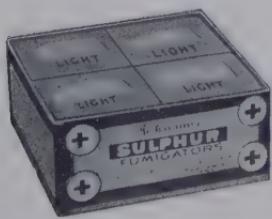
DISINFECTION

The most important point in the prevention of the spread of disease is the disinfection of rooms in which there has been sickness of any infectious or contagious nature. After the recovery or death of the patient the room should be thoroughly disinfected before being used. For this purpose the following suggestions will be found useful.



Disinfecting a room with Lister's Fumigator.

closed by pasting strips of paper or of adhesive plaster over them. All articles should be spread out and otherwise arranged so as to be well exposed to the germ-destroying gas. Mattresses and spring beds should be so placed that both sides are exposed. Window shades should be unrolled and laid out at full length. Be sure all bureau drawers are opened, pockets turned inside out, and everything thoroughly exposed to the disinfecting fumes.



Square Sulphur Fumigators, 4 in each box.



Round Sulphur Fumigator, each on a tin plate.

If sulphur fumigation is used, the air in the room must be made moist before lighting the sulphur. This can be accomplished by boiling water for an hour or two on a gas or oil stove.

Four pounds of sulphur, or four one-pound fumigators, should be used in every room.

All articles not of value, especially thick resistant cloths, should be burned.

Everything that may not be burned, such as furniture, clothing, etc., should be left in the room until the whole can be subjected to thorough disinfection with formaldehyde or sulphur.

Preparation for fumigation should be made as follows: All doors, windows, fireplaces, flues, keyholes and small openings should be securely

The room should be left closed for fully twenty-four hours and then aired.

After the room has been thoroughly aired, all furniture and woodwork, the walls and ceiling and the floor, should be wiped with a cloth wet with a disinfecting solution. The floor should be scrubbed with soap and hot water. The walls should be painted over or coated with two coatings of whitewash.

All washable bedding should be put into a pail of hot water and washed with an antiseptic.

Finally the room should again be left open to air and allowed to become thoroughly dry.

FORMALDEHYD DISINFECTION

Disinfection by formaldehyd is now recognized as a reliable and effective destroyer of disease germs and foul odors.

Formaldehyd gas has no damaging effect upon polished wood, metal, gold, silver or any of the articles ordinarily present in the household.

The preparation of the room and its contents for formaldehyd disinfection is the same as described under the general heading on preceding page.

Formaldehyd disinfection is thoroughly and easily accomplished by the use of Lister's Formaldehyd Fumigator, which generates gas sufficient for an ordinary size room. The room, after it is all sealed and the fumigator lighted, should be left closed about four hours. Water sprayed about the room aids in the efficiency of the disinfection.



Lister's Formaldehyd Fumigator

APPENDIX

ADHESIVE PLASTER

What is known as rubber adhesive plaster or, as it is sometimes termed, surgeon's adhesive or sticking plaster, should be used instead of court or isinglass plaster as an application to wounds. Rubber adhesive plaster is used by surgeons to fasten together the edges of wounds. It sticks without warming or other preparation. The uses of adhesive plaster are too numerous to mention all of them in this publication.



In applying adhesive plaster to a broken surface, the hands of the operator, the wound itself and the surrounding parts should be cleansed with an antiseptic soap (Synol), and made thoroughly dry with surgically clean gauze. The wound should never be entirely covered with adhesive plaster. The best method is to bring the surfaces together with narrow strips, leaving a space between each two strips for the wound to discharge.

When adhesive plaster is to be applied to a hairy part, the hair should be shaved off. When once closed with adhesive plaster the wound should be allowed to remain until it is healed; dressings should be applied over it. No large open or raw surface should be covered with adhesive plaster. It should never be applied to burns.

Adhesive plaster is very useful for holding dressings in place, where the patient is to be transported. Some of the more common applications for adhesive plaster are shown in the illustrations on the next page.

The adhesive plaster sold under the name of ZO Adhesive Plaster is known to the surgical profession as a desirable form of adhesive plaster. It is applied without the aid of heat or moisture. It is non-irritating and will keep in any climate. It is supplied in various forms and sizes.

A very convenient form of adhesive plaster for household use and for use in traveling, is the kind known as Zonas Cylinder. This is adhesive plaster in narrow widths, one yard long, enclosed in a handsome round case for the pocket.



NON-SURGICAL USES OF ADHESIVE PLASTER

India rubber adhesive plaster has a great variety of uses independent of its surgical application, though the latter is the more important one. In the drug store it has long been used for a variety of purposes, such as the



FIG. 138.—Chin dressing.



FIG. 139.—Holding splint dressing for finger.



FIG. 140.—Support for sprained thumb.



FIGS. 141 and 142.—Holding in place dressing of tear of leg.



FIG. 143. — Elbow dressing.

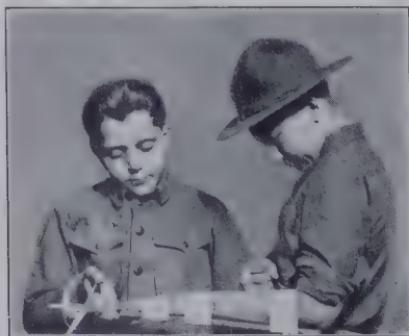


FIG. 144.—Holding simple splint dressing for arm.



FIG. 145. — Support for weak instep.

mending of broken or cracked graduates, bottles and stoppers. It makes excellent labels for vessels kept in cellars and in damp places. For this purpose the cloth back of a suitable strip of plaster is dusted with French chalk, written upon as though it were paper, slightly warmed to increase its adhesiveness and placed upon the bottle or other vessel.

It is also a very useful article for mending clothing, furniture, and India rubber articles, water bags, syringes, hose, water-proofs, mackintoshes, boots, shoes and a thousand and one articles of the household. Anything made of rubber can be repaired, patched and rendered serviceable through its use.



This statement includes bicycle tires. Every rider finds it an indispensable article for his kit, and in this respect it has superseded all liquid appliances.

Its use for mending tires is very simple. When the tire is punctured, the surface around the puncture should be dried, and a strip of adhesive plaster laid over the hole in such a way that the puncture is covered several times its length. The tire is moderately inflated and the tape passed several turns around both the tire and rim. After firmly securing the end, the tire is inflated to its full extent.

Still another use for this article is to seal covered jars and cans, making them damp-proof and air-tight. For this purpose it is only necessary to pass a strip of the plaster over the joints of the receptacle, for it will adhere readily to tin or metal, and in this it is superior to any known substance. A small strip can be used to fasten a lid to a box, making a very serviceable hinge.

It has been found that perishable articles, such as food and other substances, when tightly sealed with this plaster, are proof against any climatic change. Packages containing photographic material, when sealed with adhesive plaster, can be handled and shipped to any part of the world without deterioration, being well protected from light and moisture.

Adhesive plaster is also used largely in making up and repairing electrical apparatus, as it is practically a non-conductor, is waterproof and adaptable to a variety of uses. Strips may be applied to the hands to prevent the action of caustic or corrosive liquids, and also to the finger in the form of a "finger cot."

A quite modern application for this plaster, and one where it is most serviceable, is for the effectual closing of a room that is to be disinfected by vapors, such as sulphur fumes or formaldehyd gas. All cracks and crevices in the doors, windows, etc., are covered with narrow strips of plaster, and the room thus made vapor tight, whereas before the use of this substance, the escape of vapors in disinfecting was one of the weakest points of the process. This also suggests the use of the plaster as an emergency weather strip and to mend a broken window-pane.

Thus it will be seen that the uses of adhesive plaster are almost without number. In all cases it makes a cheap, strong and durable binder so flexible that it will conform to the shape of any surface. Probably, too, half of its uses have not yet suggested themselves.

ABSORBENT COTTON

This is a most useful article in the factory, shop, or household. Absorbent cotton does not mean ordinary cotton or cotton batting, but a specially prepared material whereby the elements in ordinary cotton (oil, wax and fat), which prevent absorption, are removed.

Absorbent cotton is by far the most generally used of all material for covering wounds, for making compresses, for padding splints and slings, or for absorbing discharges, and is adaptable to every conceivable use.



In addition to its use as a wound dressing, as suggested throughout this Manual, absorbent cotton has a large use for mechanical, laboratory and household purposes. Absorbent cotton is useful as a filter for almost any liquid. It is now employed extensively in filtering water and solutions, and in dairies in filtering milk and cream. For household uses a filter for any purpose can be quickly made by wadding some absorbent cotton into the neck of a funnel and pouring the liquid to be filtered upon the cotton. For filtering and straining purposes, cotton is much more effective and far cheaper than any other substance. In filtering watery fluids with absorbent cotton, the cotton should not be packed too tightly in the neck of the funnel. With light liquids, such as alcohol, the cotton may be packed more firmly. Absorbent cotton is useful also for a thousand and one household purposes.

There are many kinds of absorbent cotton in the market, sold in drug stores, dry goods stores, barber shops and other places. Many kinds of so-called absorbent cotton are not suited for wound-dressing purposes. Very often they are made in cotton mills of waste cotton; are filled with dirt, dust and leaves and are wholly unsuited to wound dressing or other delicate purposes.

The Red Cross Absorbent Cotton recommended in this Manual is known to surgeons as absolutely pure; that is to say, it is chemically pure and free from all foreign material. It is carefully cleansed and disinfected and subsequently sterilized within the package, and is therefore surgically clean. The cotton is rolled into layers or sheets with blue tissue paper between each of the layers and folded over the sides. It is wrapped in such a way that all surfaces, including the edges, are fully protected from dust, dirt and infection, whether in or out of the carton. It can be cut or torn into any required shape.

SURGICAL GAUZE

A thin open mesh cloth, resembling cheesecloth or mosquito netting, is used by the surgeon to a large extent. Gauze for dressing wounds should be especially prepared for the purpose, and should not be such as is purchased in a drygoods store, as such gauze has probably been made in a cotton mill where the requirements of surgery are not taken into account.



made very absorbent.

Red Cross Gauze is put up in packages of various sizes, from one yard upward. The packages are sterilized and sealed, and are thus ready for immediate application to any wound.

Gauze cloth is a convenient material for use in the household, and should be substituted for all kinds of cloths, pads, bandages and compresses in the sick room, and used for dressing wounds and sores. Surgical gauze may also be obtained impregnated with antiseptics.

An antiseptic gauze known as Boralum Gauze is excellent for dressing wounds. The antiseptic is a combination of boracic acid and aluminum acetate. It is in a measure a destroyer of infection, subdues inflammation and promotes healing of the wound. It is also applicable to old wounds and sores.

Gauze cloth may also be procured cut up into bandages in widths of from one inch upwards, and rolled in rolls of ten yards in length. The bandages sold under the name of Linton Gauze Bandages are very convenient and economical.

ANTISEPTIC MEDICATED SOAPS

Soaps containing an antiseptic are largely in use by physicians and nurses. They have found such soaps much more desirable than ordinary soaps, and they recommend them to their patients to be used in the place of toilet soaps for all domestic purposes.

Antiseptic soaps should always be used in first aid practice for cleansing the hands before touching anything, and when it is necessary to cleanse a wound in absence of medical aid. They are peculiarly useful in cleansing old wounds and sores.

Antiseptic soaps can be obtained in liquid and cake form. Some of the varieties, and their principal uses, are here enumerated.

SYNOL SOAP—This is an antiseptic soap which is used very largely by hospitals and surgeons. It is adapted to every conceivable use to which soap can be put. It has been found to be an excellent addition to the bath and toilet of surgical operators, nurses, attendants and patients.



Synol in liquid form is put up in glass bottles with a sprinkler top.

The container has finger grips which permit soapy hands to secure a firm grasp on the bottle.

Synol Soap can be used with most excellent results in the sick room at all times, especially in contagious diseases.

The constant washing of the hands with Synol Soap while attending the sick will engender in nurses a feeling of confidence, particularly when the diseases treated are communicable.

Vessels for the reception of sputum, urinals, bed pans and similar utensils may be washed with Synol Soap, and a solution should be kept in them constantly to disinfect the discharges, also to prevent them from adhering to the inside of the vessels. Clothing, towels, napkins and other articles used by the sick should be washed in a solution of Synol,

then boiled. This practice will be found advantageous in dealing with communicable diseases, eruptive fevers, etc., and will do away with the necessity of using objectionable antiseptics.

Synol Soap will be found useful for cleaning floors. In the ordinary process of sweeping, a stiff broom wrapped with a cloth moistened with a five per cent. solution of Synol Soap will remove the particles of loose dirt. Then the floor should be sprinkled with the soap and scrubbed with a stiff brush and water. Afterwards it should be flushed with a weak solution of Synol Soap in hot water. Walls may be washed with a cloth dipped in a solution of Synol Soap.

To wash parts soiled by feces or urine, Synol Soap is particularly effective. It disinfects and removes the odor.

The clothing and bedding soiled in typhoid fever, or other infectious diseases, may be washed with Synol Soap for the purpose of disinfection.

BORATED SOAP—This is an excellent soap for use of women and children. It is a complexion soap. It is bland and never irritates the skin.

To be used in the usual way for toilet soaps. In skin troubles rub lather into the skin and wipe off with a dry towel. Use by preference cold water.

CAREOLIC (CRESOL) SOAP—This is an excellent soap to have in the house for use in case of accidents. This soap is useful for the purification of wounds, sores and ulcers.

Carbolic Soap is also used for the disinfection of clothing, dishes and other articles that have been used in the sick room, or that have been exposed to persons affected with communicable disease.

Another extensive use for this soap is for the removal of insects from animals.

For purification of wounds, etc.—Make a strong suds with hot water and wash the wound.

For skin troubles—Use cold water to work up a lather—Apply lather to the affected parts and allow it to dry on the skin.

For disinfecting clothing, etc.—Use hot water and let clothes soak in suds.

For washing animals—Work up lather in cold water and rub in thoroughly.

SUBLIMATED SOAP—This soap has been found very useful in the treatment of parasitic affections of the skin, such as scabies, pediculosis, ringworm, favus, etc. It is also used to relieve itching skin and diseases of the scalp.

Physicians and nurses use it for washing wounds, sores and ulcers; for disinfecting articles from the sick room; for washing hands after contact with contagious diseases.

This soap is recommended for daily use in times of contagious disease epidemics as a protection against germ infection.

For skin diseases—Make a strong suds with cold water. Apply the lather to the affected parts and allow it to dry on the skin. If preferred, the lather may be wiped off with a dry towel. Do not rinse.

For washing sores, wounds and ulcers—Use hot water to make suds.

For disinfecting clothing, etc. Use hot water and let the clothes soak in the suds.

LISTER'S DOG SOAP—This soap is extensively used for exterminating fleas, lice or other vermin that infest and annoy animals. It is especially recommended for mange and the skin diseases of dogs, horses, cattle and other animals. It should not be used on cats.

It is non-poisonous and non-irritant and can be used with safety to the animal.

Make a heavy lather and thoroughly rub it into the hair of the animal. Care must be taken to carry the soap to the skin of the animal, so that the medicament will be given an opportunity to accomplish the desired results. A long-haired animal necessarily needs more attention than a short-haired one. In the treatment of mange the animal should be washed daily until the disease is eradicated. In washing off lather, leave some soap to dry on the skin. For the extermination of lice and other vermin, wash the animal at least three times a week.

MUSTARD PLASTER

A noted medical writer states that mustard plasters are applicable to four-fifths of all the ailments that are met in every-day life. "No matter what else we may do," he says, "or what other remedies we may use, we cannot afford to treat diseases without the use of mustard plasters. Five hundred should be used where one is now applied."

In first aid to the injured the prompt application of a mustard plaster is of great service. The following suggestions are given by the authority noted above: Wherever there is a cold surface, mustard plasters should be used plentifully on the arms, legs and abdomen, and should be kept in place from twenty to thirty minutes. Also use them for pressure of blood to the head, for coma, delirium, inflammation, nose bleed; apply to the legs, arms and abdomen.



In local congestion, brain congestion, concussion, paralysis, narcotism, headache, apoplexy, hemorrhage, stupor: apply frequently on the arms, the calves of the legs and on the stomach.

In sleeplessness, mania, spasmodic affections, hysteria, epilepsy; apply daily to legs and soles of feet.

In affections of the chest, colds, bronchitis, whooping cough, coughs, asthma, congestion; apply to stomach, legs and feet.

In vomiting, spasms, nausea, pains, seasickness; apply over stomach but not on legs unless feet are cold.

In abdominal troubles, spasms, cholera morbus, dysentery, peritonitis, painters' colic, pain in liver, colic pains, diarrhea, cholera, syphilis, pains in spleen; use frequently and plentifully on arms, legs and abdomen. Keep in place twenty to thirty minutes. May also be placed over seat of pain.

In muscular pains, rheumatism, local pains, neuralgic pains, inflammation, sciatica; apply frequently so as to draw the blood away from the affected spot to a cold surface.

How to Apply a Mustard Plaster

Soak in water (warm, but not hot) for two minutes, and apply. The mustard side goes next to the skin. If the skin is very sensitive, a thin piece of wet cloth may be placed between the plaster and the skin. The skin soon grows used to the action of the mustard, so that the use of the cloth may be discontinued. Half-strength leaves are made for use when only a mild

Mother's old reliable remedy—Mustard Plaster

action is wanted. On a sensitive skin five to ten minutes will produce a bright red patch. The plaster may then be removed and a fresh one applied in another place if necessary.

Mustard plasters should never remain long enough to produce a blister. They are likely to do this after thirty minutes. The best method is to put on a fresh one at new points until lasting red spots are produced. The red spot will burn for some minutes after the plaster is taken off, but, unless the pain is unbearable, put nothing on as a dressing. Then use full-strength grain alcohol, which will stop the burning.

DAILY CARE OF THE MOUTH AND TEETH

BY DR. B. G. SIMMONS

Decay in the teeth is now known to be caused by a germ that attacks tooth structure wherever it finds lodgment for a sufficient length of time.

Decomposition of particles of food is the starting point of this micro-organism. Absolute cleanliness within the mouth is the remedy.

To attain this condition as nearly as possible is the point we must strive for. There are three important points to be observed in best accomplishing this result.

First—Regular and correct use of the brush with proper cleansing agents.

Second—The use of dental floss silk between the teeth.

Third—The regular use of an antiseptic wash for rinsing the mouth, that has germicidal power sufficient to actually destroy germs common to the mouth and the organic ferment which is the starting point of dental caries.



The teeth should be brushed thoroughly twice a day.

The brush should be of medium stiffness, with bristles of unequal length, and in addition to the brushing across the face of the teeth it should be used with a rolling motion, brushing down on the upper teeth and up on the lower teeth so that the bristles penetrate and clean between the teeth, which is the

point where the greatest danger lies. The backs of the teeth should also be brushed and particularly the backs of the lower central incisors—a point where tartar is most apt to form. As for a dentifrice to use with the brush, there are many that are good and some that are injurious. I have always advocated the use of a pure, mild soap and the finest grade of precipitated chalk, but it is important that they be of pure quality, and this is not always easy to obtain, particularly in the soap.

Dental floss silk should be used between the teeth at least once a day, preferably after each meal. It removes particles of food that the most persistent brushing could not reach, and it is an important factor in the prevention of decay. It can be obtained on little flat metal bobbins, or in glass vials. It is far better than toothpicks.

In addition to the rules for cleanliness here given, the teeth should be examined by a competent dentist at least twice a year. After your teeth are once put in good order and these rules observed the chances are that there will be little or nothing for him to do, and if there is anything, it will be so slight an operation that it will neither give pain to your nerves nor your pocketbook. At first it will take some little perseverance to adhere properly to these rules. Remember that it is not the brush alone, the use of floss silk alone, nor the dentifrice alone that is to accomplish the desired result, but all three combined, and persistently used, to-day, to-morrow, every day. In a short time it will become so much a part of your toilet that there will be little tendency to neglect it, and your reward will be sound teeth, and also one of the greatest aids toward general good health, a sweet, healthy mouth.

FIRST AID SERVICE

THE Service Bureau of Johnson & Johnson has attained a foremost position in the world-wide first aid movement.

The Service reaches far beyond the production of outfits and supplies. It assists in the organization and installation of first aid systems in railway and transportation lines, mining companies and factories.

The Service is closely allied to, and utilized by, first aid organizations, teachers, training classes, boards of education, railways, municipal departments and others interested in first aid, in respect to text book equipments, literature, etc.

The Bureau has been of special service to teachers, instructors and classes which have been formed in factories, mines, Y. M. C. A.'s, boy scout and girls' camp fire bodies, and other institutions and associations.

The Service Bureau is prepared to co-operate with lecturers, teachers, instructors and heads of organizations and with individuals who may be interested in the subject of first aid. Persons interested in the promotion of the work of first aid in any capacity are invited to correspond with the Bureau.

In addition to the work of furnishing equipments a considerable amount of literature and other helps are supplied. The following is a partial list:

JOHNSON'S FIRST AID CHART.—A complete working guide for first aid, size 27 x 44 inches, mounted on heavy board, folds for carrying. Front in

ten colors, back contains full first aid instructions in black and white. Used by teachers, schools, teams, organizations, factories, shops, and in the home. Everybody can use it.

INSTRUCTION OUTFIT, described elsewhere in this book, used by teachers, classes, etc., contains bandages, splints and tourniquets to be used in practice work.

PUBLICATIONS

Publications upon the subject of first aid have been issued by the Service Bureau; at the present time the following are available:

JOHNSON'S STANDARD FIRST AID MANUAL, eighth edition, 144 pages, illustrated in colors. Adopted as a text-book by railway systems and first aid societies throughout the world.

FIRST AID STUDY SCHEDULE.—A pamphlet outlining the study of first aid to the injured in a systematic series of lessons. Valuable for the individual as well as for classes. Free.

FIRST AID IN ACCIDENTS, CATALOG No. 110.—Descriptive of Johnson's First Aid Cabinet No. 1, Household Accident Case, etc. Free on request.

Health Bulletins

The prevention of the spread of contagious or infectious disease is rightly made a part of first aid work.

The Service Bureau has issued a series of bulletins upon the more common contagious and infectious diseases. In each bulletin practical methods for disinfection, isolation, and care of the sick in contagious diseases, are given.

- No. 29. Typhoid Fever and Allied Diseases Bulletin.
- No. 40. Whooping Cough and Measles Bulletin.
- No. 28. Diphtheria and Scarlet Fever Bulletin.
- No. 56. Consumption Bulletin.
- No. 57. Smallpox Bulletin.
- No. 38. Infantile Paralysis and Cerebrospinal Fever Bulletin.

No. 18. A Book with a Mission. Illustrated booklet giving brief directions for the care of the more common contagious diseases.

Household Handbook. Suggestions for the prevention of the spread of disease, care of the sick, hygiene and sanitation in the household. The book also covers first aid to the injured in emergencies, etc.

All of the bulletins are free.

Address: First Aid Service Bureau, Johnson & Johnson, New Brunswick, N. J.

FIRST AID CHART

JOHNSON'S First Aid Chart covers the whole range of first aid, theory and practice, in picture and in text.

The chart is three-fold, lithographed in ten colors; the back is illustrated in black and white, and includes text matter giving complete instructions for the practical application of first aid.

It is at once a teaching chart and a practical guide to first aid work. It is an art creation, anatomically and scientifically correct. It is most complete, efficient and convenient, and opens a new chapter in the promulgation of first aid.

The subjects covered by the chart are as follows:

Bleeding	Burns and scalds
Course of the main arteries of the body	Railroad and machinery accidents
Practical methods of arresting bleeding	Foreign bodies in the eye, ear, nose and throat
Fractures	Sunstroke
Sprains, strains and other injuries	Heat prostration
Practical emergency methods of applying splints	Suffocation
Uses of the Triangular and Roller bandages	Electricity accidents
Fainting	Insensibility
Wound dressing	Drowning
Shock	Artificial respiration
	Poisons and antidotes

This chart will at once appeal to the doctor, the nurse, the instructor in first aid and to the lay student.

For schools, gymnasiums, railways, mines, first aid teams and crews, industrial plants, manufacturing institutions and everywhere that first aid is practiced, taught or studied, this chart will be of great utility.

It is a complete guide to first aid that anybody can use who can understand a picture.

For illustration of this chart see the opposite page.

FIRST AID CHART



Johnson's First Aid Chart, size 27 x 44 inches, mounted on heavy board. Folds for carrying. The front is in ten colors. The back contains full first aid instructions in black and white.

Be Prepared for an Emergency

Johnson's TRAVELKIT is a handy little first aid outfit in a round-cornered metal container. It is of such a size that it can be slipped into the pocket, carried in a traveling bag, dropped into the pocket of an automobile, or kept in the kitchen table drawer.

IT CONTAINS

Gauze Bandages
Adhesive Plaster
Iodine
Surgical Gauze
Absorbent Cotton
Carbolized Petrolatum
Picric Acid Gauze
Compress Bandage
Band-Aid
Safety Pins
First Aid Guide
Colored First Aid
Chart



Buy One at Your Druggist's and Be Prepared

Band-Aid for Instant First Aid



Band-Aid is a surgically clean protective dressing for minor cuts, bruises and abrasions. It combines a gauze pad, for instantly dressing an injury, and adhesive plaster, for holding the dressing firmly in place.

There is a distinct danger in ignoring any wound. Whenever the skin is broken, there is a possibility of infection, which, even in a small wound, may produce abscess formation, and, sometimes, blood poisoning.

Band-Aid is a handy dressing to apply to the numerous cuts received by children at play and to the ordinary injuries incident to household or any mechanical work. Numerous uses, such as protecting blisters on the feet, covering corns, etc., will suggest themselves to you.

Band-Aid is procurable from your druggist in cartons containing six strips, ready for use, and three wider pieces, to be cut as needed.



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